A CHILTON PUBLICATION

the Iron Age

NATIONAL METALWORKING WEEKLY

August 28, 1952

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TS PAGE 2

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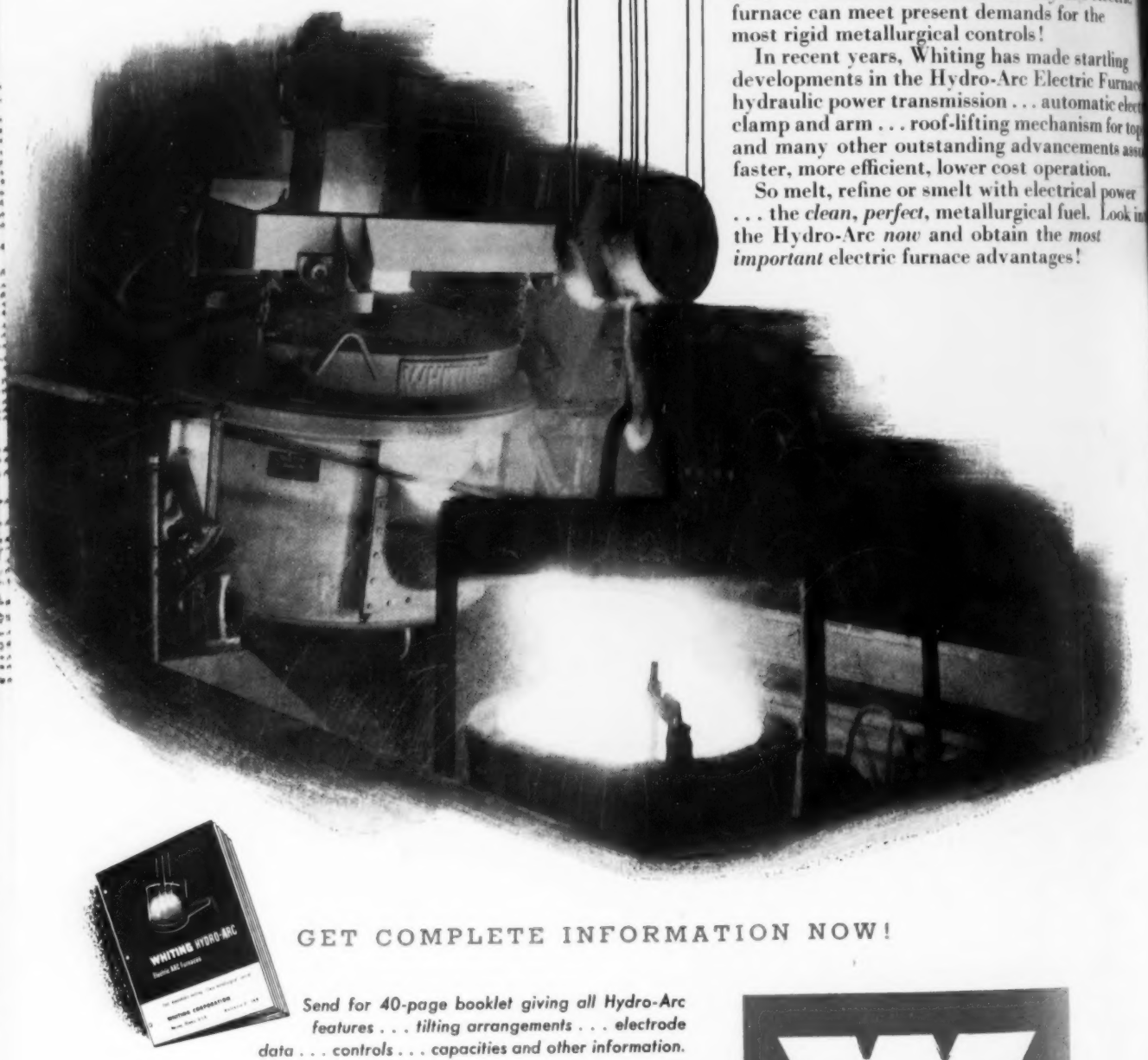

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North Dillard Bridge, Douglas County, Ore. Fabricators: Poole, McGonigle & Dick, Portland. General Contractors and Erectors: Tom Lilleho, Reedsport, Ore.

MAYARI R

Replaces Last Timber-Truss Bridge on Pacific Highway

The last of the old timber-truss bridges, once common along the Pacific Highway, has given way to a new deck-girder structure built largely of Mayari R. Spanning the South Umpqua River about 9 miles below Roseburg, Oregon, this bridge is another example of the increasing structural use of low-alloy, high-strength steel.

The bridge consists of 3 continuous-plate-girder spans and 2 reinforced-concrete approach spans. The total length is 504 ft. The floor beams, stringers, girder webs, girder-flange angles, girder-cover plates, and splice material are Mayari R. These parts were designed on the basis of 27,000 psi in tension, which allowed a substantial reduction in the deadweight of the bridge.

Weight-saving is only one of the advantages provided by Mayari R. Besides having almost double the yield point of the structural carbon grade, Mayari R also has 5 to 6 times as much resistance to atmospheric corrosion. It retains paint up to 80 pct longer. It has better resistance to abrasion and impact. And it can be fabricated by the usual methods employed for carbon steel. It is used in the as-rolled condition, without heat-treatment.

For further information about the structural uses of Mayari R, including suggested stresses for bridge design, write for a copy of Catalog 259.

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Export Distributor: Bethlehem Steel Export Corporation

Mayari R *makes it lighter... stronger... longer lasting*

The Iron Age—DIGEST of

Vol. 170, No. 9

August 28, 1952

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THE IRON AGE, published every Thursday by the CHILTON CO. (INC.), Chestnut & 58th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 8, 1932, at the Post Office at Philadelphia under the act of March 3, 1879. $8 yearly in United States, its territories and Canada; other Western Hemisphere Countries, $15; other Foreign Countries, $25 per year. Single copies, 35¢. Annual Review and Metal Industry Facts Issue, $2.00. Cables: "Ironage," N.Y.

NEWS DEVELOPMENTS

TIN CANS RECOVER WASTE COPPER AT MINES—P. 39
Southern California each month ships 5400 tons of shredded tin cans to Arizona copper mines. There they are used to recover waste copper from mine waters. Yield is 1 ton of copper from each 1.25 tons of cans. Estimated need is 7600 tons per month plus 4000 tons when Anaconda's new plant starts operations.

PLANE PRESS PROGRAM COPES WITH BIGNESS—P. 41
Mill around the neck of the Air Force's heavy press program to make plane parts in one operation is massive size of presses, equipment. Designers plied their trade with one eye on the customer's desires, the other on whether anything this big was feasible. Air Force discounts die sinking trouble reports.

DEFENSE BUILDING GETS MATERIALS PRIORITY—P. 48
National Production Authority has given defense construction top priority over non-defense building this winter. Residential building will not be hurt, however, as ample supplies of materials are now in inventory or distribution channels. DPA extended quota tickets because of steel strike caused delays.

LIVING COST PAY RISE DUE AUTO WORKERS—P. 54
Bureau of Labor Statistics cost of living index rose as of July 15. This means an automatic pay increase for United Automobile Workers—CIO members. Probable boost will be 3¢ per hr. Total increases under the famous escalator clause will then stand at 26¢ per hr since the contract went into effect.

OIL PIPE REQUESTS MEET CLOSE SCRUTINY—P. 59
Oil field operators faced with tall production goals are clamoring for pipe in Washington. Their allocations applications are getting magnifying-glass treatment. Hardest hit by the pipe shortage are wildcat operators. PAD does not expect drilling operations to reach pre-strike level for several months.

PUSHING METAL BOOM IN NEWFOUNDLAND—P. 67
Youngest of Canada's provinces shows signs of becoming a leader in metal and mineral production. It is already well-known for its ore deposits. Government is pressing Britain to help develop Newfoundland's natural resources. If no interest is shown, the U. S may be asked to make investments.

of the WEEK in metalworking

ENGINEERING & PRODUCTION

SELF-BAKING ELECTRODES IMPROVE FURNACES—P. 95
Reliable operation of continuous, self-baking electrodes has enabled the construction of larger, simpler and improved electric furnaces. Covered furnaces permit collection of waste gases. Savings in coke and limestone have been reported. Lower electrode consumption and cleaner operation resulted.

WELDMENTS REPLACE HEAVY PUMP CASTINGS—P. 100
An oilfield pump approaching weight limits for portability prevented use of additional weight in designing new higher capacity unit. Big castings were replaced with weldments combining castings and plate which reduced weight by 4,000 lbs. Castings better for intricate shapes and heavy sections.

SCREW MACHINE FORM TOOL 90 PCT CHEAPER—P. 102
Simple tool holder which holds two standard carbide blanks, replaces three expensive dovetail form tools on a multiple spindle automatic screw machine job. Tools are used on automatic screw machines for machining stainless steel valve bodies in three different sizes. Tool inventory has been cut 90 pct.

DIESEL HALVES POWER COSTS IN SCRAP YARD—P. 104
For years Consumers Steel & Supply Co. found savings in generating its own power with three small diesels. However, to handle the load they had to run full blast. Slow response to load changes let voltage fall so magnets would drop heavy pieces. New diesel-generating unit handles load at half cost.

COLD WORKING CAN SOFTEN SOME METALS—P. 106
Cold working is a partially reversible process. A metal can be work hardened by plastic deformation of one type, and then work softened, within limits, by plastic deformation of a different kind. Thus hard-worked metals can be softened without heating. Some heat treated steels are affected.

NEXT WEEK—AUSTENITIC CAST ALLOYS AT LOW TEMP.
Design engineers of new low temperature processes are turning to austenitic Cr-Ni cast alloys where toughness and corrosion resistance is needed. Degree of toughness from room temperature to —432°F for the various alloys can differ widely. Care should be taken in selection and treatment of alloys.

MARKETS & PRICES

STAMPERS MUST RAISE PRICES—RELUCTANTLY—P. 37
Many metalworking companies are now wincing at the idea of raising prices when they get OPS pass-through of costs permission. Stampers find competition keen and hate to do so but economic necessity may force their hand. The idea must be sold to their cost-conscious customers. Will they be willing?

CAN U. S. LIMIT RED-WEST EUROPE TRADING?—P. 44
Curbing of trade of non-security goods between free nations of Europe and the Soviet bloc can be achieved only by opening up new trade sources to supply products now exported by Russia. U. S. tariff barriers may have to be lowered and export prices cut, study shows. New sources must be able to compete.

TOOL SHIPMENTS SKYROCKET TO NEW LEVELS—P. 65
Tool shipments for '51 more than double rate of previous year. Current pace indicates 1952 will be even better. Shipments of boring mills increased 155 pct last year and now rank only behind lathes and grinding machines. Ohio holds lead as largest producer. Machine tool backlogs show slight increase.

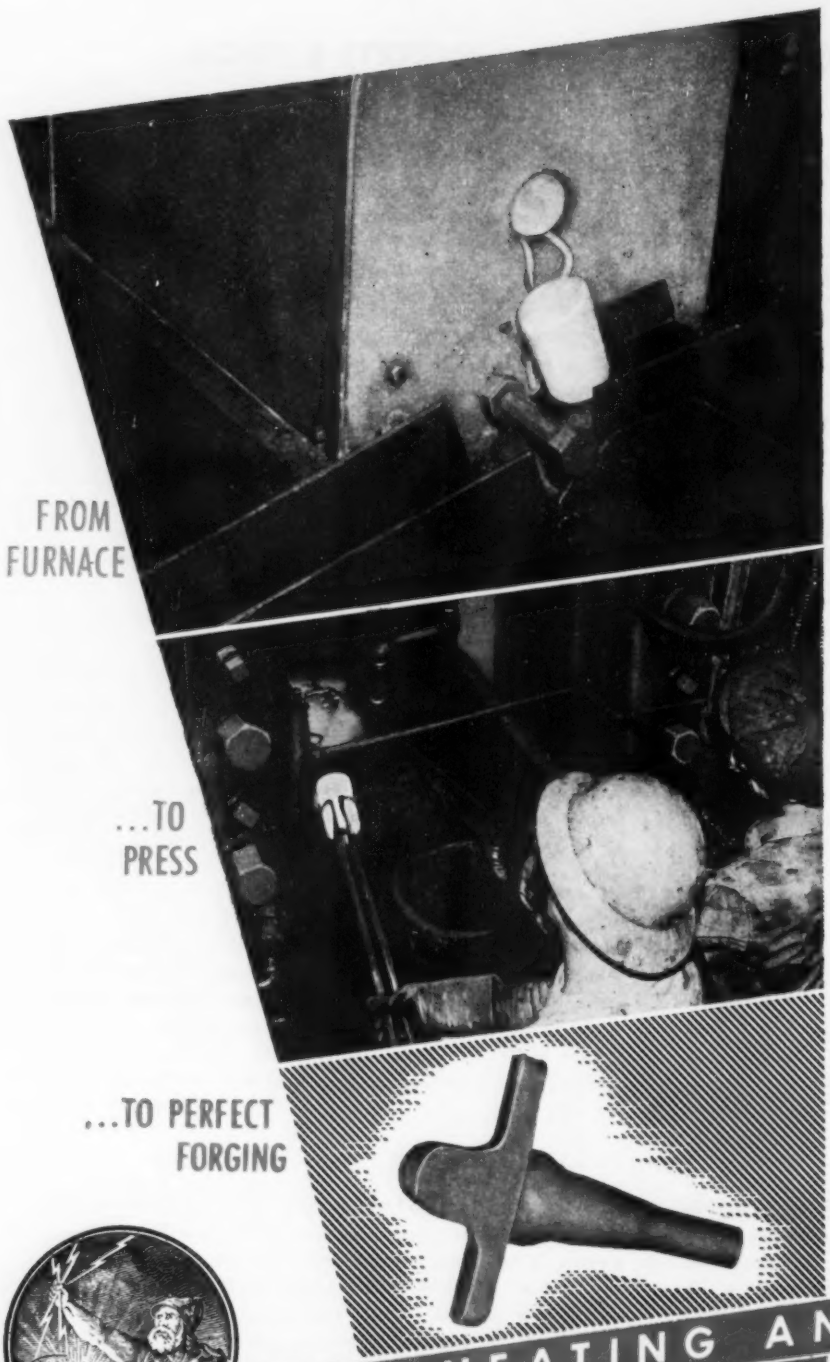
MANUFACTURER GETS INFLATION IN THE NECK—P. 127
Although Washington has set up a stepladder for inflation by permitting fat wage hikes, it is now crowing that wild inflation is not probable. Manufacturers facing competition and a slow market don't dare raise prices much. It means that the manufacturer is getting the high cost load put on him.

ASK MINIMUM ASSISTANCE FOR TAIYA WORKS—P. 130
No accelerated amortization requested for 1.6 million-hp hydroelectric installations. Would take fast tax writeoff on half the cost of other facilities. Alcoa wants only a fair shake as stockpile supplier. Would reserve any or all of output for government for 5 years, 20 pct for independents for 20 years.

SCRAP MARKET STAYS STEADY AS SHE GOES—P. 134
Movement of scrap was generally brisk across the country, with steelmaking grades at ceiling prices. The market for cast iron grades is holding its own, but that's all. Prices stayed generally at last week's levels, but showed few signs of rising. Spot shortages of freight cars were a nuisance in some areas.

Saves ten tons of steel a day—

WITH AJAX-NORTHRUP INDUCTION HEAT



Improved forging methods, using Ajax-Northrup induction heat, have reduced billet weights for these axle spindle forgings from 7½ to 5¼ pounds. Resultant steel savings add up to *ten tons* of SAE 5132 bar stock a day!

Up to 720 scale-free billets per hour are fed directly from an Ajax-Northrup heater to 1750-ton Maxipress extrusion presses. Forgings are formed in one operation, saving time and labor, and reducing floor-space and equipment requirements.

Ajax-Northrup heat saves up to 20% of original billet weight. First, by elimination of scale, and second, by accurately controlled, even, penetrating heat which permits forging to extremely close tolerances . . . 2 ounces for an 8-lb. connecting rod, to quote another example.

Better heat means better fiber flow, too. As a result, fatigue resistance of the axle spindles is reported to be 17.3% better than that of conventionally heated, hammered forgings.

Ajax-Northrup can save steel, time, and labor in your plant, too. Write us today . . . call on our 35 years of induction heating and melting experience.

SEND FOR NEW INDUCTION HEATING AND MELTING BULLETIN

136

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AJAX ELECTRIC COMPANY, INC.
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THE IRON AGE

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Till Death Us Do Part

THERE are faint signs that those who paid little or no taxes a few years ago are now finding out what it means to do so. Whether it will cause them to do something about it is questionable.

As long as we have the defense program and increased wages we will have more and heavier taxes. Attempts to cut the federal budget have been meat axe tactics and not the result of calm study and proper trimming.

Since this is an election year taxes will be a prime topic in all speeches and statements. The best way to cut taxes is to cut taxes. It takes a lot of political courage to do it.

Once taxes are slapped on it is hard to get them off. Once the meat axe is swung on the budget wrong things may be cut and things that should be cut are untouched. A few congressional hearings here and there based on emotion and vote-getting are not the way to attack the tax question.

There are too many pressure groups who want things cut for the other fellow but not for them. But the day is coming when the goose not only refuses to lay a golden egg but won't be able to muster enough pep to lay any egg at all.

There is one thing we can do that may help to make us and the consumer more tax conscious. Some companies are doing it. Let's put on the price tag all the different taxes that have been tacked on to the selling price. Comparing that total figure with the price the item would cost without the extra heavy tax load would jar some people awake to what they are really paying to the government.

We must have some taxes but the way they are plastered on industry and ultimately on the consumer is downright dishonest. Government would have one believe that taxes are not a cost of doing business. That kind of talk is for the birds.

Several million price tags listing the taxes separate from the cost of making the item would be a big help to those who want people conscious of what taxes they pay without knowing it.

Till death us do part we will have taxes but let's know and tell others what they are and how big they are.

Tom Campbell

Editor

The Facts about

Electrical Controls for Fork Trucks

...and what they mean to you

YOU'VE BEEN HEARING many impressive sounding phrases such as "*automatic acceleration,*" "*full contactor control,*" "*non-plugging controllers,*" etc., used by electric industrial truck salesmen to describe their controls. Some of you have asked us "What do these features mean to me in terms of performance and operating costs?"

Here are the Simple Facts:

Twelve years ago Baker recognized that careless operators were damaging trucks and loads by making "jack-rabbit" starts. Often motors were burned out by the high surges of current resulting from this abuse. The sudden jolting of loads frequently caused them to fall off the forks.

Even greater damage was caused by "truck jockeys" who jammed controls into full reverse while travelling forward in high speed. This is called "plugging" the motor, and is just about as disastrous and costly to the truck as it would be if you tried it on your car.

So, in 1940, Baker engineers attacked the problem of *controlled acceleration* to combat "jack-rabbit" starts. Trucks at that time all used drum controllers which cut out resistance in the circuit as the speed lever was advanced.

Baker Introduces Contactor Control

One of the first apparent improvements pioneered by Baker, was *contactor control.*

The contactor has many fingers which open and close to bring resistance in and out of the power circuit. A brief delay between the closing of each contact is required to provide smooth acceleration. On some electric-powered machines, dash pots, filled with graduated amounts of air, govern the closing of a bank of contactors to gain the desired effect.

For industrial truck purposes, however, we found that this system required more technical maintenance skill than was available in the average user's plant. Chief sources of trouble were fouling of the dash pots and the continued arcing as fingers opened and closed.

Obviously, a better method was needed to provide time delay. Baker then called in leading electrical experts and with their help developed a contactor with magnetically controlled time delay. This was a vast improvement, but the contactor still presented a complex maintenance problem. So, in 1943 Baker set out again.

Baker Rejects Full Contactor Control

As an alternative to contactor control, Baker engineers devised an ingenious acceleration circuit for the drum controller that required the operator to start in first speed and remain there for the split second required to stabilize current in the motor and get the truck rolling gradually and smoothly. *The truck could start in no speed but first.*

Tests proved satisfactory, so Baker moved to the next problem—"motor plugging" or immediate reversal of controls.

Baker Develops Dynamic Braking

Our engineers then designed a dynamic braking circuit which, when controls are reversed, brings the truck to a smooth stop before it reverses the current. This system uses the inertia of the truck to turn the motor—which, during deceleration, becomes a generator supplying current to prevent the reversing circuit from going into action.

The net effect is like shifting your car into second as against reverse, if you wish to slow down.

Dynamic braking is invaluable as an auxiliary brake on steep grades. *No other industrial truck manufacturer offers it as standard equipment.*

* * *

Now, to come back to the question "What does this mean in terms of performance and operating costs?"

Just this: Baker now provides simple and positive methods of *controlled* acceleration and deceleration. This means safer handling of loads and less wear and tear on truck and motor.

Other manufacturers, it is true, make similar claims. But they still employ full contactor control—with its staggering maintenance costs. We know: we pioneered the contactor system now in common use—only to abandon it for something better.

This is another example of the user-benefits researched and engineered by *Baker*, the oldest name in electric vehicles.

For a copy of a new 8-page booklet on Baker features and equipment, write for Bulletin 54.

Baker INDUSTRIAL TRUCKS **The Baker-Raulang Co.**
1227 West 80th St. · Cleveland 2, Ohio

Dear Editor:

Letters from readers

1 + 1 = 1

Sir:

I just finished reading your editorial "1 + 1 = 1" in the Aug. 14 issue and I wish to take issue with your mathematics.

During the time when Mr. Putnam has been stating that the fabricators are going to absorb the price rise in steel, Mr. Ellis Arnall has been broadcasting to various and sundry listeners the fact that this increase in the steel price will mean an increase in the cost of living by $100 to each American family.

With this in mind I am suggesting you change your formula to read as follows: 1 + 1 = 0, or in other words, Mr. Putnam plus Mr. Arnall equals zero.

J. V. ROWAN
President

Lee-Rowan Co.
St. Louis

Can You Help?

Sir:

We are anxious to solve a problem in our warehouse. We write you in the hope that you might have the solution.

Upon receiving crated steel sheets from the United States and Europe it is necessary to count them as well as weigh them, due to the slight variance of weight per sheet. It has been practically impossible to determine the actual amount of sheets in each crate, particularly when they are thin gages.

This problem increases with European sheets as the variance of weights in the sheets of any particular gage is substantial. Inasmuch as occasionally we have to count 100 to 150 sheets at a time, it has interested us to learn of any gadget that will do this operation automatically.

W. POLVARINI

Armco Uruguaya S.A.
Montevideo, Uruguay

Perhaps one of our readers may be able to give a solution to your problem.—Ed.

Selenium Farms

Sir:

Reference is made to the item on p. 35 of your July 31 issue concerning the possibility of harvesting selenium as a farm crop.

Will you please send us full details on this subject?

A. KERZNER

New Jersey Metals Co.
Elizabeth, N. J.

This item was based on a portion of the Report of the President's Materials Policy Commission, vol. IV, p. 110, prepared by Battelle Memorial Institute, Columbus, Ohio. "Farming" for selenium would involve growing certain plants which absorb relatively large amounts of selenium and building accumulator installations to recover the absorbed selenium.—Ed.

Clarification

Sir:

A number of us here have read this item from the Aug. 7 Newsfront page with much interest: "The Russians have made considerable progress in use of aluminized steel . . ."

We realize that your Newsfront items have to be brief and pointed but it was perhaps unfortunate that you used our registered trade name, Aluminized Steel. As you no doubt know, we are the sole producer of Aluminized Steel in this country.

It probably would have been better in this case if you had used the generic term, aluminum-coated.

W. E. McFEE
Supervisor, Product Information Service

Armco Steel Corp.
Middletown, Ohio

We should have said "aluminum-coated." There's no suggestion that the Reds were able to get hold of any of your Aluminized Steel.—Ed.

Portable Tester

Sir:

In your Aug. 7 issue, p. 63, you have an item regarding a portable device for determining drawing quality of cold reduced sheet and strip.

This product is of interest to us and we would like to know the name of the manufacturer.

B. P. EVANS
Purchasing Agent

Cold Metal Products Co.
Youngstown

The manufacturer is Steel City Testing Machines, Inc., 8843 Livernois Ave., Detroit 4, Mich. But see P. 38 this week first.—Ed.

Arc Welding

Sir:

On the Newsfront page of your July 24 issue there is mention of new improvements in arc welding in an argon atmosphere which have been achieved in the "Nerthal" process developed by Soudure Autogene Francaise.

Can you give me additional information on this process?

B. H. McKIBBEN
Chief Metallurgist

Niles Rolling Mill Div.
Sharon Steel Corp.
Niles, Ohio

Write to Soudure Autogene Francaise, 75 Quai d'Orsay, Paris, France, for more details on the Nerthal process.—Ed.

WHERE

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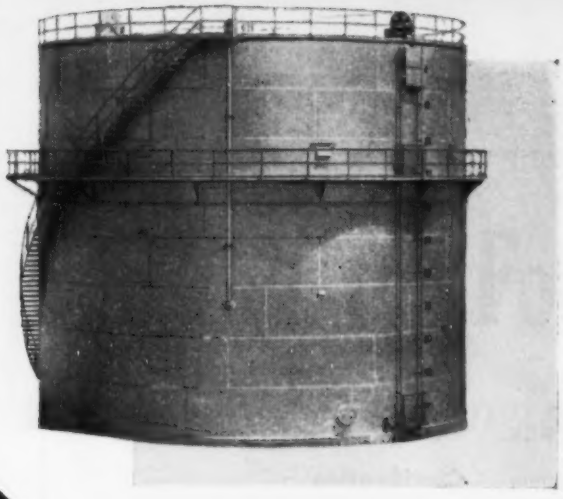

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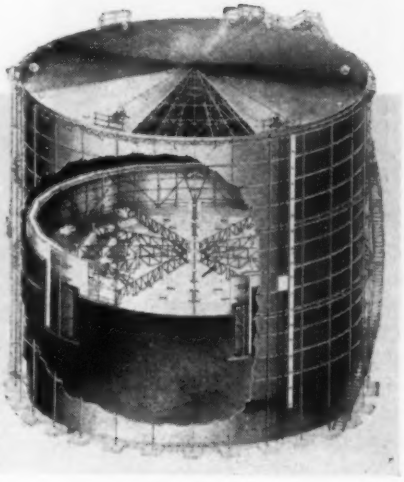

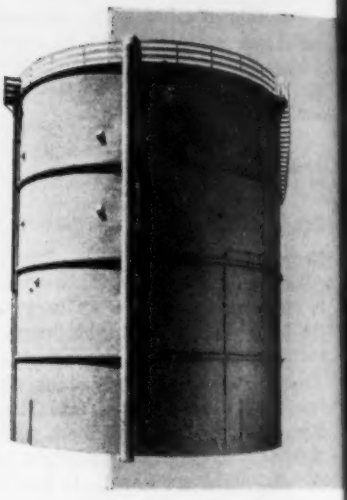

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The absolutely dry, frictionless seal of the WIGGINS GASHOLDER is gas-tight and impermeable. Can't freeze or "hang up" —there's *no* water—*no* tar—*no* grease. *No* complicated mechanism. *No* gadgets. *No* operating costs. *No* maintenance costs.

Ask us about installations made from coast to coast for economy-minded process engineers—men who *know* that the Simplicity of the WIGGINS GASHOLDER in operation *always* results in Efficiency and Economy.

Send for Bulletin WG-22! It's written for you!

WIGGINS VAPOR SEALS
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135 South La Salle Street, Chicago 90, Illinois
Offices in all principal cities

The Iron Age
FOUNDED 1855

THE IRON AGE Newsfront

► Die casters making aluminum and magnesium die castings for aircraft parts are studying use of stainless steel wire inserts in place of cast-in steel bushings. Final cost figures are not available but evidence points to savings in labor now spent in inserting bushings in dies. Also, losses of bushings in rejected castings may run as high as 20 pct. It costs too much to recover bushings.

When using wire inserts, parts would be cored when cast. An additional tapping step would be needed to seat the insert.

► High strength laminated glass parts are now being fabricated for test in aircraft applications. These parts have a favorable strength weight ratio compared to most metals. Phenolic adhesives will be tried as a fastening method.

► Nevada may be the site of the first atomic energy power plant for industrial use. Low cost power would open up certain ore fields to mining. These are dormant because of too-high costs.

► Railroad officials warn that today's light shortages of hopper cars will be aggravated after end of the coal union's "safety inspection" vacation period. Consumers will hasten to add to their stocks in anticipation of a strike. Meanwhile, heavy steel mill shipments of finished steel and receipts of ore and raw materials have caused spot shortages of some types of cars. In some railroad yards box cars are said to be plentiful because manufacturers have curbed shipping pace because of steel-shortened supply of steel.

► Wide publicity heralding the transistor (to replace the vacuum tube in many applications) may have been premature. The transistor has a vast potential. Research goes on to fit transistors to specific applications. Radio Corporation of America reports development of the first very-high-frequency transistor for communications. It's said to have frequencies as high as 225 megacycles.

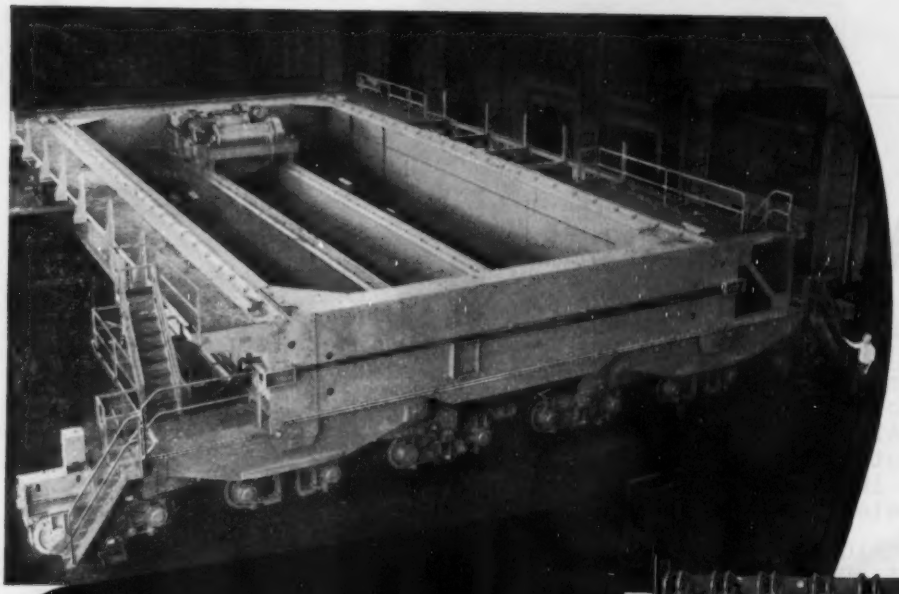
► Fully austenitic welds in type 347 stainless steel are most susceptible to cracking, indicates a study made for Atomic Energy Commission. Electrodes having a lime type coating, with compositions balanced to give at least 5 pct ferrite in nondilution weld pads, are least susceptible to microfissures.

► First large (10,000-kw) single unit reversible hydraulic pump-turbine in the U. S. is being built by Allis-Chalmers for Flat Iron Power & Pumping plant of Bureau of Reclamation in Colorado. These units can conserve water and increase revenue for utilities by pumping into the reservoir during low load periods and serving as generator for added premium-priced power during peak loads. Units show efficiencies of 89 pct both as pump and turbine.

► Don't be surprised if the biggest snafu in the Air Force heavy press program turns out to be die making capacity. Despite handicaps posed by immense sizes of the product, use of heavy forgings in aircraft is growing. For instance, 3 years ago the 18,000-ton press at Wyman-Gordon was working at 10 pct of capacity. Today it and all other available presses are working overtime. One of the many factors complicating the program is delivery of diesels the heavy presses require. It takes at least 7 or 8 months for delivery. The diesel casting has to cool for 4 months after pouring.

► Wolfram has been found in Turkey. The field is at Ulu Dag, near Bursa. Length of the vein hasn't yet been established but the find is believed important. Two pct wolfram content was in samples.

► Add Pontiac to list of autos planning new engines for 1954. Performance of the present in-line engine is satisfactory. But the feeling is that a substantial percentage of the auto buying public prefers a V-8 engine. The buyer's the boss today.

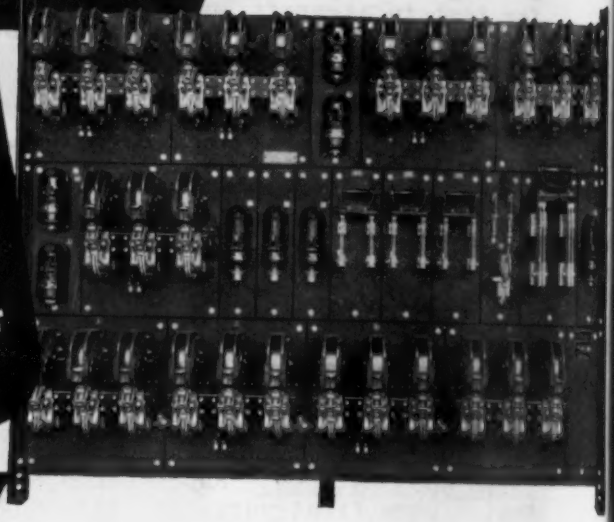


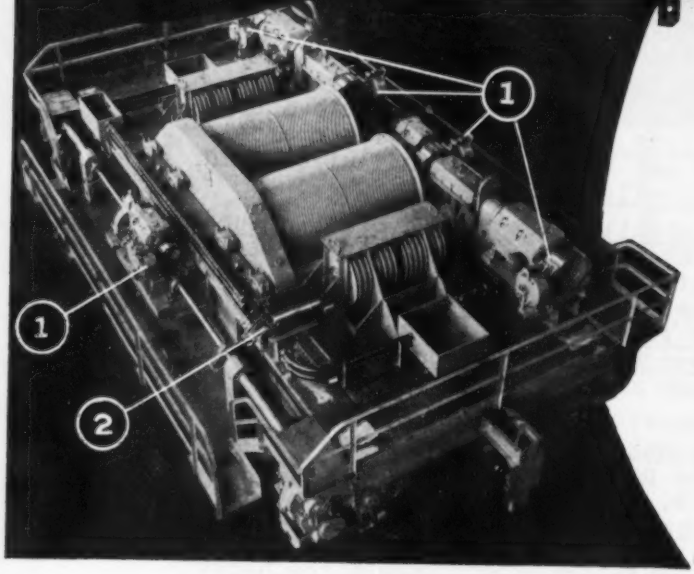
350-ton Ladle Crane on erection floor of Morgan Engineering Company.

6 MOTORS CONTROLLED AS 1

UNDER

EC&M TRIPLEX TIME-CURRENT Controller





The above EC&M Triplex Time-Current Controller controls 3 sets of motors in parallel, each set consisting of 2 motors connected in series. Uniform current peaks during starting, accelerating and plugging operations are maintained in each set of motors by this EC&M Method of Control.

The trolley for this crane (at left) is also EC&M equipped: Type WB Brakes (1) on the hoist and trolley motors, and EC&M Duplex Safety Hoist Stop (2) for the hoist motors.

When Buying Cranes It Pays To Specify EC&M Control

THE ELECTRIC CONTROLLER & MFG. CO.

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The Iron Age
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News Section

PRICES: No Call to Cheer at Upping Them

Stampers boxed in, screw machine products makers little better off . . . But there's economic necessity to boost prices . . . Must sell idea to cost-conscious customer—By J. B. Delaney.

For many metalworking companies Office of Price Stabilization permission to increase prices to offset higher costs will call for no celebration. Higher prices are a grim economic necessity for the industry but certainly no reason for cheers. Here is a slice of overall industry that may be a clue to what is happening elsewhere.

Metal stampers, contemplating a poor 1952 profit position and stiff competitive conditions, are asking this question: "What's good about asking higher prices from customers who were squawking their heads off about your old prices?"

The stampers have been having tough sledding. Even before steel, aluminum, and copper prices went up, many stampers were forced by competition to cut prices below ceiling. Highly competitive bidding made sharp pencils a downright necessity in the industry.

Cost Conscious—It's not going to be easy, some say, to sell durable goods manufacturers, already cost-conscious due to competition for the consumer's dollar, on the idea of higher prices by suppliers.

Other stampers feel manufacturers will take the increases in stride as a reflection of a period of general inflation coming up because of Office of Price Stabilization's pass-through of higher manufacturing costs (p. 61).

Trouble with this, says the uneasy group, is that a general increase in price levels may or may not materialize. If it doesn't, the manufacturer of a television set or a washing machine will continue to drive a hard bargain on materials in order to keep his own prices down.

Below Capacity—In the last 3 months new orders for stampings have not kept pace wtih capacity to produce. Some stampers have been operating only part-time. Average operating rate for the industry has been 75 to 80 pct. But activity of some stampers has been well below this.

Still, rising materials, labor, and transportation costs make higher prices for metalworking plants a matter of *economic necessity*. It's a case of getting more for your product or sending out for a plentiful supply of red ink. The industry is caught in a squeeze that leaves higher prices the only way out.

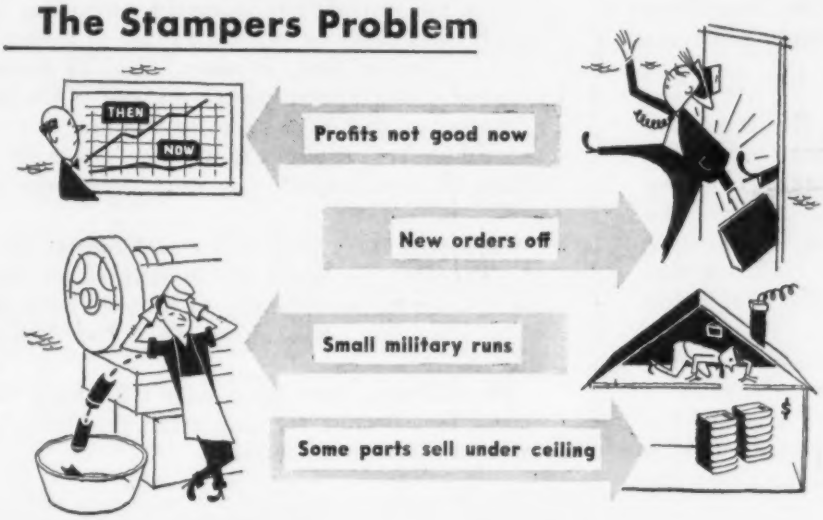
Before metals went up in price, material costs took close to 40 pct of the sales dollar, on the average, for the stamping industry. Increased metals and other costs will boost this considerably. Some companies say their costs are up 20 pct. In addition metalworking wages have had to keep pace with other industries.

Up 8 pct—The industry feels it cannot operate profitably without a 100 pct pass-through on material cost increases, plus at least part of higher wage and transportation costs. On an average, the industry feels its selling prices must go up 8 pct if it is to maintain its present position. Indications are that a 100 pct pass-through on material cost rises will be permitted.

Competitive position of screw machine products manufacturers has been better than that of the stampers. While civilian business of both has declined, military orders of the screw machine group average 50 pct of total business, compared with 25 to 30 pct for the stampers.

Automotive business of stampers took a sharp nosedive during July. Shipments to car producers were 50 pct, new orders 57 pct of the 1947-48-49 base period—lowest point since this index was started in 1950. Gains in military and "all other" business raised the average for July to 90 pct of the base period.

The Stampers Problem



Seek Higher Pay — On the other hand the materials and labor problems of

the two groups are similar. They have already granted wage and fringe benefits to employees to the limits allowed by Wage Stabilization Board rules—in a few instances special permission was granted to top these limits. Some of the benefits just won by the steel workers have been part of metalworking contracts since 1950.

Nevertheless, their workers are applying pressure for further advances. A small eastern screw machine products manufacturer employing 25 men recently lost two key men who quit to take other jobs at better pay. The industry is afraid this pressure will continue.

Sawyer Report—In Washington, Secretary of Commerce Sawyer discounted the possibility of steel price rises leading to serious inflation. He said that a Dept. of Commerce survey indicates "major price changes are not indicated for the rest of the year."

Reasons he gave for negligible inflationary effect of the steel price rise were: Purchasing power of over half a billion dollars lost by steel strikers has had a deflationary effect, consumer buying resistance may stiffen even more if price rises on products became general, immediate inflation has been softened by use of substantial existing inventories.

In commenting on consumer resistance, Mr. Sawyer said, "While relaxed credit controls have already been a stimulant to purchasing, the facts are that there has been no mad rush to buy automobiles . . ."

Must Absorb — He continued that in a great many cases the manufacturer, because of competitive conditions, absorbs the steel price increase. Foundation for his optimism on inflation was area reports on industry thinking on price rises.

Yet several industries were emphatic on the desperate need to raise prices immediately. Some manufacturers were faced with the necessity of raising prices despite competition.

Flex-Tester Measures Sheet Drawability

The familiar sight of a stamping press operator bending a corner of a steel sheet by hand to test the steel's drawability may soon be a remembered relic of stamping plant operations.

Jones & Laughlin Steel Corp. has developed a mechanical control instrument designed to replace the hand-bending routine. Called a Flex-Tester, the unit measures resistance to bending, giving an accurate guide to the drawing quality of cold-reduced strip steel.

In conjunction with the Flex-Tester, a spherometer has been adapted to measure the diameter of the bend in the sheet. This measurement is said to provide a reliable indication of a material's susceptibility to stretcher strain during the draw.

In use, the operator bends back a corner of the steel sheet

with the Flex-Tester and reads the resistance to bending on a dial. For severe draws, a mark of 60 has been determined as the approximate dividing line between steel that can be drawn and that which can't.

After the Flex-Tester reading, a spherometer is used to measure the diameter of the bend. The smaller the diameter, the greater the likelihood of stretcher strain developing during the draw.

Test takes less than a min and J & L reports that Flex-Tests show excellent correlation with existing standard tests such as Rockwell, cup test, yield point, tensile strength and elongation.

Flex-Tester has already been tried and proved in automotive stamping plants, the company states. Application of the instrument is not restricted to stamping operations, however. J & L says it could easily be adapted for use in strip mills.

In a stamping plant, as many blanks as desired can be tested before drawing without destroying any of the material. Another advantage is that little operator training is required. In order to get Flex-Test readings that are corrected for thickness of the sheets, the operator need only use a micrometer and then refer to a conversion table.

Application in a strip mill would consist of making a series of tests along the length of the strip at the temper mill. With the mill stopped momentarily, an 8-in. slit could be cut in the edge of the strip with a hand shear. Then Flex-Test readings could be taken.

Arrangements have been made with Steel City Testing Machines, Inc., Detroit, for commercial production of both the Flex-Tester and the spherometer.

COPPER: Tin Cans Help Recovery

Southern California ships 5400 tons of shredded tin cans monthly to Arizona copper mines . . . Reclaim waste copper from mine waters . . . Demand still rising—By T. M. Rohan.

National Production Authority and western copper miners both love those southern California housewives. For they are setting aside 5400 tons of tin cans per month for Arizona mines where they reclaim 1 ton of sorely needed copper for every 1.25 ton of cans—copper otherwise wasted. The 5400 tons is still short of the 7600 tons needed. What worries NPA, however, is the 4000 additional tons needed for Anaconda's new $40-million plant at Yerington, Nev., 60 mi southeast of Reno. This will start producing 60 million lb next year. An 18,000-ton tin can stockpile is also advisable on starting to prevent interruptions.

Up and down the West there are probably tens of thousands of tons of tin cans discarded monthly. Southern California housewives are required to segregate the cans from other refuse. These are sent to shredding plants in Los Angeles, San Diego and Phoenix and processed for economic shipment to mines. This currently accounts for 10 pct of western copper production.

Won't Work Elsewhere—In other places the cost of separating tin cans runs to about $50 per ton. Since copper mines only pay about $10 it is economically impossible. NPA reports other inducements such as "war effort" appeal and threats of copper civilian goods shortages have fallen flat. Neither is there money to subsidize collection. Scavengers in Oakland, Calif., made a concerted effort and lost money.

If an economic separation method can be found, additional shredders must also be set up at a cost of from $50,000 for a small one to $500,000 for a type to handle all metal. Capital would not be difficult to find since the operation would be profitable and as long-lived as the copper shortage.

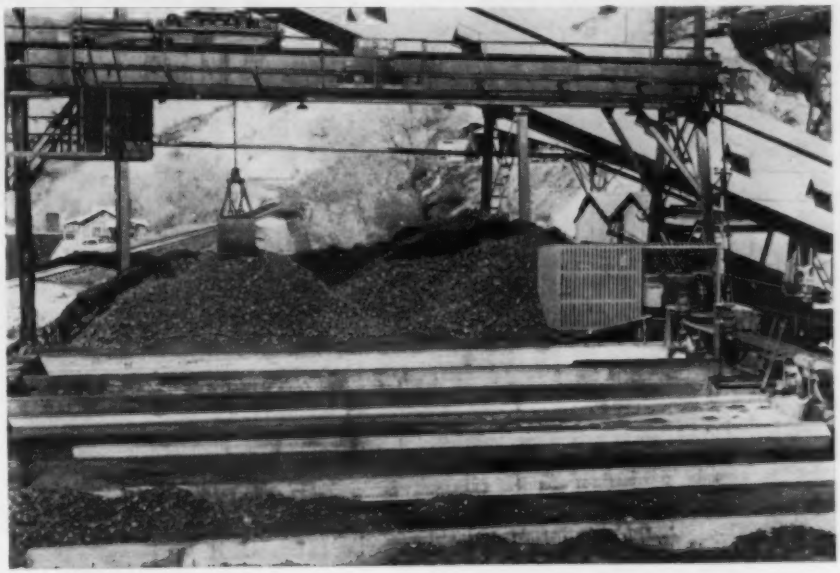
Simple—The reclamation process is simple. In the mining country for years small boys have secreted railroad spikes and other large pieces of iron or steel in copper mine water. In a few weeks the nails take on a copper coating which can be polished to a dull gloss. This same chemical action is used in recovery by tin cans.

Water from the mines, either stagnant or from processing, bears copper sulphate. When passed over a bed of cans shredded to expose the greatest surface, the copper replaces the iron in the cans and is deposited as "cement copper" of 65 to 90 pct concentration. Replacement takes place since copper is higher on the electromotive scale of activity than iron. Chemical action is expressed by the equation $CuSO_4 + Fe \rightarrow FeSO_4 + Cu$.

Due to this same action miners' shoes fall apart if nails are used. All tanks must be wood, concrete or lead-lined; pumps are bronze, nails and wire are copper, and pipes are lead, plastic or rubber.

Best Method—As early as 1860 pig and scrap iron were placed in copper bearing mine water for the copper "bonus."

Tin cans have been used for at least 30 years and found the best method. Early this year NPA ordered all tin cans in nine southern California counties which had been going to steel mills made available to copper mines. These counties are closest to mines and shredders and beyond them freight rates are prohibitive.



IN THE SOUP: Tin cans are loaded into iron launders by gantry crane at Inspiration Copper Mine.

The copper shortage, of course, is well known. The defense effort currently requires 60 to 75 pct of the world's known copper production; by 1955 demand will be 250,000 tons over the estimated supply. Up to 200,000 tons is in sight but expanded requirements will call for 50,000 tons additional.

In April Reconstruction Finance Corp. approved the biggest single business loan in its history to Magma Copper Co., New York, for $111,288,000 for low grade copper mining in Arizona. In Michigan once-scorned copper tailings are being dredged up (THE IRON AGE, June 19, 1952) and marginal deposits re-explored.

MERCURY:

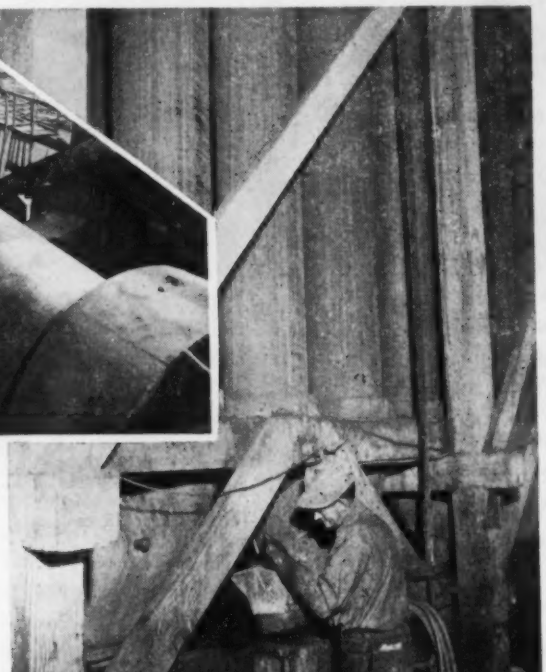
Korea brought quick resurgence of life to quicksilver mines.

U. S. mercury mines took a beating when the price dropped after World War II. Many were forced to close down, since profit margins in mercury mining are slim.

Korea brought the price up and restimulated domestic mining. U. S. sources were also helped by high priced foreign mercury and the government's program to spur strategic materials mining.

Chief domestic source of mercury is California, accounting for 85 to 90 pct of this country's output. Nevada ranks second, and Oregon third, both with small production.

SITE: View from above of the Mount Jackson-Great Eastern mercury mine at Guerneville, Calif. Mine shop is in foreground, extraction plant in center, entrance to mine shaft at left.



Largest U. S. producer last year was the Mount Jackson-Great Eastern Mine at Guerneville, Calif., 70 miles north of San Francisco. Mine has had a turbulent history: Work was stopped until 1914 by the 1906 earthquake, and again from the end of World War I until 1939. Operation since then has been continuous save for a brief shut-down after World War II. Current market price of refined mercury is $186 to $189 per flask, f.o.b. N.Y.C.

EXTRACTION: Crushed ore travels through revolving kiln at upper left as vaporized mercury rises into condensing towers, drains at bottom. Water seals prevent loss of vapors.

REFINING: Unrefined mercury or "mud" is poured on a sloping table where it is separated from sulfur with an ordinary garden hoe. Refined mercury is drained at end of table, transferred into 76-lb shipping flasks.

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PRESSES: Jumbo Size Poses Problems

Air Force heavy press program battles obstacles of massive size . . . Designers must consider many angles of bigness . . . How several tricky problems were routed—By G. F. Sullivan.

The Air Force's heavy press program to make aircraft sections in one operation instead of a myriad may not go through with the full precision and speed originally planned. Heaviest weight around its neck has been massive size—size of the program itself, size of presses and accessory equipment.

There has been no lack of slick brains turned loose on the task by Air Force and government. Attesting to this is the largest contractor in the project, Loewy Construction Co., (Hydropress) New York, which has nothing but praise for cooperation of government people.

Some of the design problems overcome were almost staggering. First came the usual difficulties of conforming to the customer's ideas in designing the presses. Designers could not simply sit down and decide definitely and quickly what they wanted to build. They had to investigate the many new considerations posed by bigness.

One of these was transportability. Would a part on the design board prove to be too much of a goliath for freight cars to handle? When a tentative design was drawn up, the railroad was consulted to determine if the part could be hauled from the shop to the installation site. Where larger press sections have been cast before (notably at Bethlehem Steel) they stayed in the same plant.

Easier Erection—Another problem was the size of columns or tie rods. Normally these are round column forgings. But one prospective press builder came up with a design employing so many columns there wasn't enough clear space for efficient working of the press.

Loewy's solution was to make the tie rods of laminated plate or forgings.

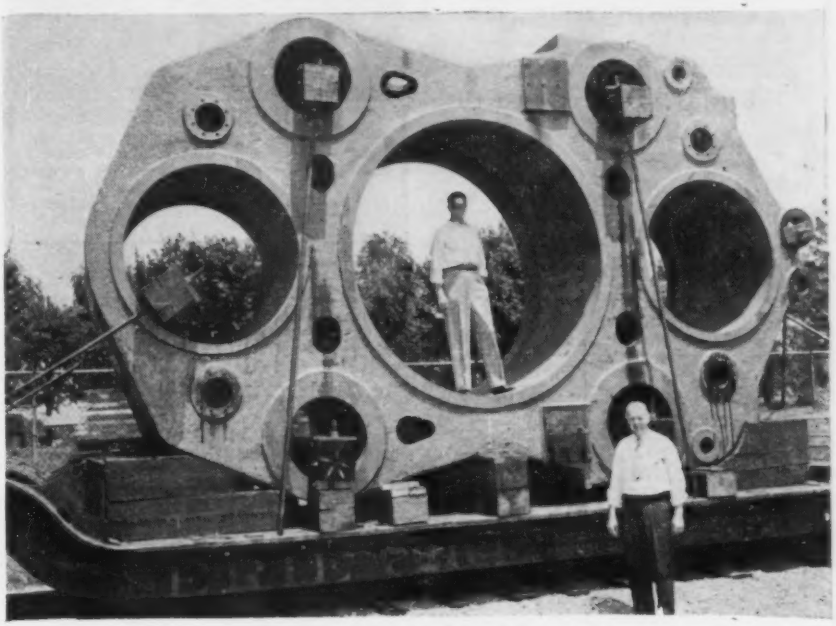
This dodged the limitation on forging capacity. (Some tie rods would have been too heavy for existing forging capacity.) Erection will be less difficult.

Bottleneck in very heavy casting or forging capacity would be even worse if all main cylinders were designed as castings or as one-piece forgings. In either case machine time on heavy mills able to finish these cylinders would have stretched schedules still further.

Innovation—Instead of conventional cylinders Loewy will—for the first time—use a laminated steel plate cylinder developed in conjunction with and patented by A. O. Smith Co. This design reduces the amount of machining required. It combines forgings with a number of relatively thin steel plates, rolled and welded to form the main body of the hydraulic cylinder.

This helped, but it did not answer the question of where to get all the heavy press castings (a 30,000-ton press platen casting weighs some 125 tons). Jam in heavy casting capacity is so bad that European foundries have been given some contracts. With U. S. capacity loaded, officials in the castings section of National Production Authority's Iron & Steel Div. surveyed European foundries.

Size of other parts was a challenge too. Bethlehem Steel is credited by Alexander Zeitlin, vice-president of Loewy and Hydropress, with working out a technique for forging the huge flats required for the tie rod laminations. Bethlehem has also knocked the end out of a heat treating furnace and rebuilt it to accomodate these forgings.



JUMBO: This 107-ton casting is a cylinder housing for Aluminum Co. of America's 13,200-ton extrusion press. Made in Dusseldorf, Germany, the casting was shipped to Alcoa's Lafayette, Ind., where the press will be installed.

Are We Short on Die Sinking?

With the Air Force straining to push its vast heavy press program to completion, a disquieting note reared up. Would the project be considerably delayed because American die sinking capacity was inadequate? Could we make

AMERICAN CHEMICAL PAINT COMPANY

AMBLER CHEMICALS ACP PROCESSES PENNA.

Technical Service Data Sheet

Subject: IMPROVING PAINT ADHESION ON STEEL WITH GRANODINE®

INTRODUCTION

"Granodine" is a zinc phosphate coating chemical which improves paint adhesion on steel, iron and zinc surfaces. In the Granodizing process, a non-metallic crystalline coating is formed on the treated metal. This bond holds and protects the paint finish and thus preserves the metal underneath.

Official Dept. of Defense Photograph

An F4U Corsair with the Navy's new aircraft anti-tank rocket, the "RAM". A Grade I zinc phosphate finish (JAN-C-490) protects the entire external surface of this rocket and provides a durable bond for the specification paint finish.

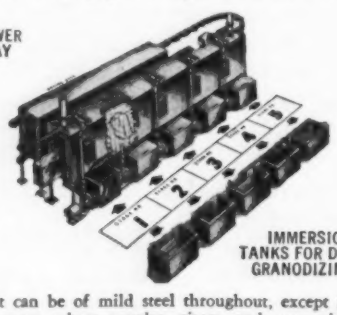
"GRANODINE" MEETS SERVICE SPECIFICATIONS

JAN-C-490, Grade I	CLEANING AND PREPARATION OF FERROUS METAL SURFACES FOR ORGANIC PROTECTIVE COATINGS
JAN-F-495	FINISHES FOR EQUIPMENT HARDWARE
U.S.A. 57-0-2C Type II, Class C	FINISHES, PROTECTIVE, FOR IRON AND STEEL PARTS
U.S.A. 51-70-1, Finish 22.02, Class C	PAINTING AND FINISHING OF FIRE CONTROL INSTRUMENTS; GENERAL SPECIFICATION FOR
MIL-V-3329	VEHICLES, COMBAT, SELF-PROPELLED AND TOWED; GENERAL REQUIREMENTS FOR

GRANODIZING DATA

Granodizing is an easily applied chemical process. Depending on the size, nature and volume of production, Granodizing can be carried out by spraying the parts in successive stages of a power washing machine, by dipping the work in the cleaning, rinsing and coating baths contained in tanks, or by brushing or flow coating the work with portable hand equipment. Typical process sequence and equipment requirements are shown below:

MULTI-STAGE POWER WASHER FOR SPRAY GRANODIZING



IMMERSION TANKS FOR DIP GRANODIZING

PROCESS SEQUENCE
1. Clean
2. Rinse
3. "Granodine"
4. Rinse
5. Final Rinse

NOTE: Equipment can be of mild steel throughout, except in the Granodizing stage, where nozzles, risers, and pump impeller should be of acid-resistant material.

MANY APPLICATIONS

Automobile bodies and sheet metal parts, refrigerators, washing machines, cabinets, etc.; projectiles, rockets, bombs, tanks, trucks, jeeps, containers for small arms, cartridge tanks, 5-gallon gasoline containers, vehicular sheet metal, steel drums and, in general, products constructed of cold-rolled steel in large and continuous production are typical of the many products whose paint finish is protected by "Granodine".

CHEMICALS ACP PROCESSES

WRITE FOR FURTHER INFORMATION ON "GRANODINE" AND YOUR OWN METAL PROTECTION PROBLEMS.

CHEMICALS ACP PROCESSES

these tremendous dies or make enough of them with existing facilities?

In aswer to these queries from THE IRON AGE, the Air Force went on record that the situation is not as desperate as it seems. True, most die shops can't make dies for these giant presses. But the Air Force believes it can beat this "shortage" by having press users make their own dies in their own shops. Machinery needed to do this is on order now.

Use Detroit?—There were rumors that the Air Force intended to rope in Detroit auto plant shops to make dies. But the facts are these: Although simple die sets can be sunk in 2 or 3 weeks, complex sets may take months, depending on size of cavity, shape, etc. The Air Force says Detroit's helping out in the tough machining phase of this work would save no time. Detroit has thus far shown no signs of wanting to be bothered.

Press operators allowed long lead times in ordering die making machinery. Delivery of some items is scheduled for 2 years after orders were placed. The Air Force revealed that maximum size of contemplated die sets will be 250,000 lb.

Factory Work Week Drops in July

National factory work-week dropped by 30 min to 39.9 hr in July, new Labor Dept. reports show. Shut-downs due to the steel strike and vacations are blamed for the reduction from the June level.

Decreases of from 1 to 2 hr in the work week are reported for the month in the primary metals, transportation equipment, ordnance, machinery, and electrical machinery industry groups. Overall decline in hours in these industries was about twice as large as was registered in the same period last year.

Shorter hours this year in the metalworking industries were instrumental in reducing the July, 1952, work week to 40.5 hr from 41 hr in July, 1951.

SUPPLIERS: Glad of Auto Output Rush

Car producers backed by army of parts makers, relying on each other . . . Parts makers see better business as Detroit tries to make up production lost in strike—By *R. D. Raddant.*

Behind the impressive Detroit facade of high auto production are legions of automotive parts makers who provide a multitude of divergent products to the parent industry's assembly lines. Fortunes of automakers and their parts suppliers are inextricably bound together. Today, the auto industry and its suppliers are together fighting off the steel strike hangover.

Laid low by the same strike shortages of steel that afflicted Detroit, suppliers are now putting their plants back into normal production. Some of these manufacturers are not overly pessimistic over the future. They can see ahead a few months and what they see looks good. Beyond that point no one cares to guess.

Output Rush—What is buoying up their hopes for a stretch of fullspeed production is a rush by auto plants in the next few months to pick up some strike-lost production. Several parts makers indicate they hope to pass pre-strike output levels. Many parts plants are now working on parts for 1953 models.

Because parts suppliers work far in advance of automobile plant schedules, parts inventories are adequate. With a solid auto market possible for the first part of 1953, parts makers are showing more optimism now than they did before the steel strike.

On yet another front—that of auto replacement parts — ample stocks are seen for the balance of 1953. So says National Production Authority. Inventories of both passenger car and truck parts are reportedly strong despite the steel strike. Export needs are being filled on schedule and back order situation was not worsened by the strike.

On Own Feet—Makers of parts for new autos form a group that is an adult and self-supporting member of the Detroit family.

Parts manufacturers range in size and scope from Briggs Body, an industrial giant in its own right, to possibly a small manufacturer of valves. The Automotive Parts Manufacturers Assn. has 350 member companies which together employ 400,000 workers. A great variance in size and products makes it nearly impossible to find a rule of thumb for all.

Interdependence—There is virtually no product made by parts companies that isn't also manufactured by at least one auto company. On the other hand, no company makes all its parts. This interdependence helped suppliers keep going through a large part of the steel strike and also helped them get back to work soon after the steel strike ended.

Some of the bigger parts companies such as body and wheel plants have the purchasing volume to stand on their own feet in the competitive buying and conversion market of the present steel situation. Manufacturers of smaller parts, however, don't have the standing to fight on these terms for vital steel.

Here is where the paternal influence of the customer auto plants figures. During critical steel periods, auto plants have found it advisable to spread available steel among suppliers who found the going tough.

The result is that parts manufacturers have inherited indirectly some of the benefits of the auto industry's favored position in the steel market.

STEEL IN PASSENGER CAR
Pounds of Steel by Type

Hot-rolled bars	532
Cold-rolled bars	81
Wire products	187
Pipe and tubes	10
Structural shapes	30
Hot-rolled sheets and strip	1,652
Cold-rolled sheets and strip	964
Plates	45
Terneplate	43
Total	3,544

Source: American Iron & Steel Institute

For Lack of a Bar—Take, for example, a company supplying a certain type of gear. During the strike and shortly after, it no doubt couldn't get the bars necessary to supply its customer. The big customer, however, was up to his ears in conversion and at the same time putting all possible pressure on steel sources.

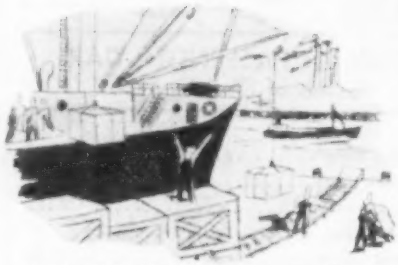
Obviously, the company couldn't let its production be stymied for the lack of a few bars. So the bars, which probably represent only a small amount to the auto company, were loaned to its supplier.

Then too, parts manufacturers are into defense work as much as industry in general. It's estimated that about 10 pct of their work is earmarked for defense. This gives them some priorities help.

TRADE: How to Curb East-West Barter

Export price cuts, lower tariffs may be only method of limiting trade with Soviet . . . U. S. must establish alternate trade sources . . . State Dept. trade policy tangled.

Lower tariffs and slashed export prices may be the only way to curb trade between the free nations of Europe and the Soviet bloc. Such is the realistic view of the United States Council of the International Chamber of Commerce as expressed in a report entitled, *The East-West Trade Controversy.*



JUSTIFIED?: Main reason for the West's trading with the Soviet bloc is the imports it receives.

USC favors continuance of forced restrictions on trade of war goods between Western Europe and Russia. In addition, it regards Western Europe's dependence on Red countries as outlets for other types of goods and as a source of imports as being economically suicidal, since these markets can be shut off at a moment's notice.

Instead of indulging in customary self-righteous indignation over East-West trade USC places the responsibility for limiting such transactions on the U. S.

Imports Important—Key to the East-West trade problem, the report points out, is the *imports* which Western Europe receives from Russia and its satellites. Western European dealings are motivated by the fact that certain goods can be obtained more cheaply from Russia than elsewhere.

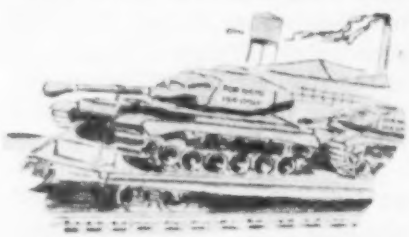
Though East-West trade has dropped considerably since the last war, individual nations still depend heavily on Iron Curtain countries for specific imports. More than 14 pct of the coal consumed in Italy in 1950 came from Eastern Europe. And the United Kingdom gets much of its timber and food staples from the Soviet bloc.

Before we can object to Western Europe's exporting non-security goods to Russia, USC believes we must establish new sources of imports. These alternative sources must be able to provide the same products the free European countries now get from Russia and at comparable prices.

Stumbling Blocks—Three major obstacles must be overcome before the tap controlling the flow of Western European exports to Russia can be turned off. Prices of goods from the new import sources must be on a par with the Soviet's. Countries receiving imports from these alternate sources will have to pay for them in dollars rather than using the barter system now predominant in East-West trade. Supplies from the new sources will have to be shipped, and shipping space is already at a premium.

Means of overcoming these difficulties are not easy. USC suggests the dollar problem could be softened by a reduction of tariff barriers. This would enable Western Europe to export more of its goods and as a result have more dollars to pay for imports.

No solution is offered on the shipping problem, and USC hedges slightly on methods for lowering the prices of goods exported from alternate sources.



RESTRICTIONS: Bans on defense item trading are not the complete answer to the East-West problem.

The report states, "There is little doubt as to the relatively greater costliness of the alternative sources of supply. . . . It follows that if these channels are to be developed, American cooperation and even assistance is indispensable."

More Aid? — This delicately worded proposal raises the question of whether the U. S. is willing to increase its already heavy financial burden by subsidizing Western European imports in one form or another. Opposition would certainly be strong.

CONFUSION: The State Dept.'s policy on trade with Russia is hopelessly tangled in expediency.

In addition to calling for a revision of our current policies on East-West trade, the report states the U. S. should make a study of the significance of imports from behind the Iron Curtain and examine methods of developing alternate trade channels. Until such studies are made it will not be possible for the U. S. to develop a rational policy on East-West trade, the report stated.

Meanwhile, the State Dept.'s policy on strategic trade with Russia is hopelessly entangled in expediency. Many West German firms have been blacklisted by the U. S. for trading with Soviet Germany. Yet the State Dept. shows remarkable reluctance in according equal treatment to firms in other Free World countries doing the same thing.

One thing is certain—the State Dept. wishes no publicity on the subject. Reply to an IRON AGE query was a very secretive "no comment."

ALUMINUM: Next Frontier Alaska

Alcoa awaits nod from U. S., Canadian governments to proceed with Taiya Valley project . . . Plans 1.6-million-hp hydro-power facilities, reduction capacity of 400,000 tons.

Aluminum's next frontier will be Alaska. It will as soon as Aluminum Co. of America gets the official nod from the U.S. and Canadian governments to go ahead with its Taiya Valley project.

The company is itching to get started in the Skagway area where the hydro-power potential is terrific—1.6-million-hp facilities are planned. A two-stage project has been blueprinted with a total aluminum reduction capacity of 400,000 tons a year. If necessary, both could be built simultaneously but Alcoa plans an initial capacity of 200,000 tons. Metal would be poured about 4 years after construction begins.

Some $400 million of private capital would go into power plants, smelters, transportation facilities, a 20,000-population modern community and other necessities. Alcoa asks a minimum of government aid (see page 130). Permanent year-round jobs would be created for approximately 4000 persons.

First Hurdles—Before any work can start, Alcoa must acquire about 20,000 acres of land in the area. This will probably require congressional legislation because of existing laws governing land purchase in Alaska.

Since water for the turbines will originate over the border, in Canada, governmental permission must also be obtained there. Preliminary discussions with both U. S. and Canadian agencies have been encouraging.

Project Described—The Yukon River rises in a series of large lakes in British Columbia and the Yukon Territory. A dam would be built at Miles Canyon where the river flows through an 80-ft-wide canyon. This would back up the water in five lakes to an elevation of 2200 ft above sea level. Because of the nature of the terrain, very little land would be flooded.

Generators would be installed at the Miles Canyon Dam for electricity to be used by the community of Whitehorse and surrounding areas.

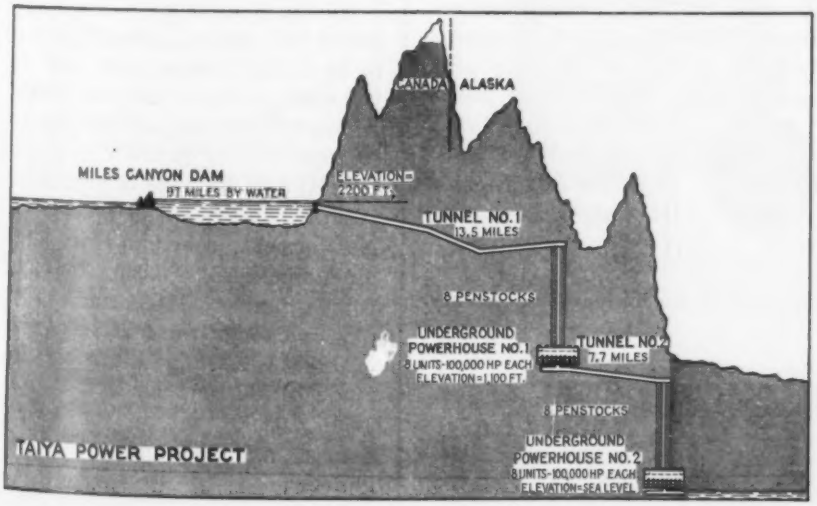
At the south end of the reservoir a 13.5-mile tunnel would be drilled through the Rocky Mountains, dropping 1100 ft to the first power station. Discharge water from this installation would then go through a 7.7-mile tunnel and drop another 1100 ft to the second power plant. Each installation would have eight 100,000-hp generators built inside the mountain.

Reduction facilities would be located at the lower end of Taiya Inlet, accessible by deep water, rail and the Alcan Highway. Town site and other installations would be near the smelter.

A Beginning—Alcoa vice-president and general counsel Leon E. Hickman, in a speech at Mt. McKinley National Park last weekend, said that the project would be the largest in Alaska providing year-round employment.

"It would be not only of itself of enormous benefit to the sound development of Alaska and the Canadian Northwest, but would also point the way for other permanent industrial operations in the area," he stated.

At least initially, alumina would probably be shipped from Alcoa's ore refining plants in the Northwest at Vancouver and Wenatchee. Source of bauxite would be South America. As refining capacity in the South grows, there would probably be a swing to alumina plants at Bauxite, Ark., and Mobile. Fluorides would be shipped from expanding capacity at East St. Louis.



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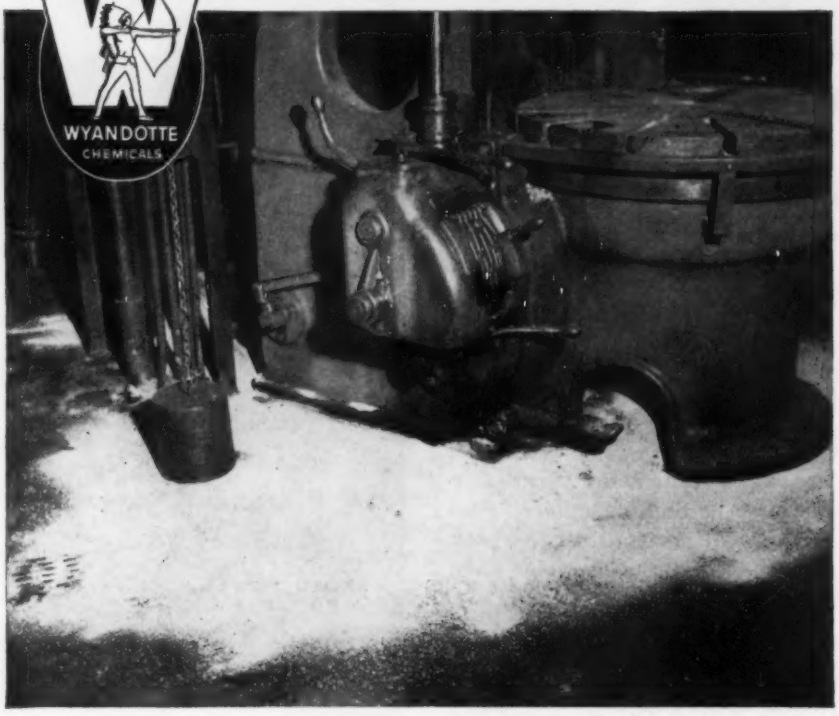

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OIL:

PAD approves new 1600 mile pipeline from Texas to New Jersey.

Oil customers on the East Coast, plus those in Pennsylvania, Ohio, and Kentucky are slated to benefit, supply-wise, from the new 1600-mile pipeline soon to be built from Beaumont, Tex., to Newark, N. J.

Completion of the 450,000-bbl-per-day line is slated for September, 1953. Present plans call for a 300,000-bbl-per-day movement rate at first, with gradual stepping up of deliveries to the 450,000-bbl-per-day mark.

About two-thirds of the products to be moved through the new line—heating oil, kerosene, gasoline, butane, and propane—will be delivered to Newark for East Coast consumption. Remaining one-third will be diverted at such intermediary points as Pittsburgh, Columbus, and Paducah, Ky.

Petroleum Administration for Defense, which put its okay on the project last week, estimates the project will require a total of 319,500 tons of pipe, plate, and structural shapes. Line will be 24 in. in diam from Beaumont to Jackson, Tenn. (550 miles), and 22 in. from Jackson to Newark (1045 miles). A 14-in. spur will extend from Jackson to Paducah.

Allotments Needed—PAD has allotted 211,000 tons of steel for the project thus far. This means U. S. Pipe Line Co. will have to seek further allotments or turn to conversion steel if it is to complete the project by next September.

Of the 211,000 tons already allotted the project, 194,000 tons is to be in the form of pipe, and 17,000 tons in plates and structurals. About 170,000 tons of the pipe allotment will be in 16-in. or larger pipe, and 24,000 tons in pipe under 16 in.

Allotment schedule for large pipe includes 20,000 tons in fourth-quarter 1952, and 50,000 tons in each of the first 3 quarters of 1953. Small-pipe allotments include 10,000 tons for first-quarter 1953, 10,000 tons in the second quarter, and 4000 tons in the third quarter.

BONUS FUNDS:

SSB cuts down paperwork . . . No report needed on bonus fund boosts.

Employers no longer need report to Salary Stabilization Board when there is an increase in bonus funds because of growth in the size of employee groups eligible for bonuses.

Amend. 1, General Salary Stabilization Reg. 2, calls only for employers to maintain records of bonuses for 3 years following each calendar year in which they pay bonuses.

This amendment was among four liberalizing actions involving reporting and filing requirements, announced by SSB on Aug. 19. Paperwork was cut down.

A new form, No. 302, has been designed to take the place of four separate statements formerly required on stock option and stock purchase plans. Use of the form was authorized by Amend. 1, GSSR 4, revised.

Filing requirements related to pension plans and defererd profit-sharing and stock bonus plans were suspended by Salary Stabilization Board by Amend. 1, GSSR 6.

Murray Gets Pay Rise

Phil Murray, president of the United Steel Workers of America and Congress of Industrial Organizations, has been given a raise. The USW International Executive Board boosted his salary $15,000 a year to $40,000. Mr. Murray receives no pay as president of the CIO.

Vice President James G. Thimmes and Secretary-Treasurer David J. McDonald were voted raises of $10,000 bringing their salaries to $25,000 a year. The union's district directors voted themselves pay increases of 50 pct—from $8000 to $12,000 per year.

It was reported that Mr. Murray objected to his $15,000 boost as too much. He wanted it cut to $5000 merely to maintain a differential between his own salary and that of Thimmes and McDonald.

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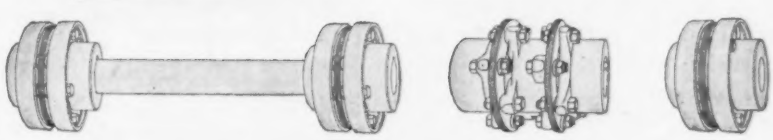

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MATERIALS: Build for Defense—First

NPA gives top priority to defense construction over non-defense . . . Extend allocation tickets . . . DPA okays new defense plants costing over $266 million . . . Homes unhurt.

Upcoming foray for the steel, copper, and aluminum essential to commercial and industrial construction this winter is now officially weighted by National Production Authority in favor of strictly defense-essential projects.

Outlook for non-defense construction, as a result, is dim. And NPA sees little change in this gloomy picture for at least 6 months. Paradox now arising, however, is that home-building rate will not be seriously crimped. This is possible because there are ample supplies of the metals that go into residential construction already in inventories or elsewhere in distribution channels.

Top Priority—Defense Production Authority is assigning top priority for controlled materials necessary to defense construction during the fourth quarter. And because of anticipated delays in steel deliveries, the agency has extended the validity of third quarter allotment tickets through November, and of fourh quarter tickets through February.

Latest batch of third quarter defense construction projects approved by DPA includes 184 different jobs, estimated to cost more than $266 mililon. These new projects are in addition to 830 other undertakings, estimated to cost more than $1 billion, previously approved for third quarter construction. (See table)

It is expected the government's newly-granted permission to use conversion steel will prove beneficial to some construction projects which might otherwise be pigeon-holed.

Conversion — NPA has ruled that up to 500 tons of conversion steel may be used in fourth quarter 1952 and the same amount in first quarter 1953 to supplement steel supplies for industrial construction jobs. Projects requiring more than the total of 1000 tons are to be referred to NPA.

The agency is not making any commitments on whether the extra authorizations will be granted, but it hints that it will approve the applications for extra rations in all cases possible. Any conversion steel consumed will not count against regular steel allocations for the specified projects.

The government expects anticipated removal of Regulation X (Federal Reserve Board rule which fixes minimum down payment and credit) on Oct. 1 to cause a "substantial" upturn in the demand for new homes. The government is not too concerned about an immediate translation of the "demand" into terms of actual "starts" until next Spring, however.

Hibernate — It is pointed out that builders and owners of residential property do their planning in the winter months and start construction with warmer weather. Winter housing starts may be higher than usual, but not at a rate high enough to gobble up all inventories of supplies and materials.

In the first 7 months of 1952, 669,700 homes were built. Seasonally adjusted rate hit 1,088,000 in July. Enough steel, copper, and aluminum had been set aside for about 1 million new homes this year. But the final number of new housing starts may be under this figure.

New Projects Granted Third Quarter 1952 Allotments

(Note: Data in this table are also included in Table II)

CATEGORY	NO. PROJECTS	EST'D COST
(1) Aircraft	14	$7,474,595
(2) Aluminum, Magnesium	4	4,064,400
(3) Building Materials	6	9,968,724
(4) Chemicals	47	80,926,429
(5) Consumers Goods	7	1,818,872
(6) Containers & Packaging	4	1,176,800
(7) Copper & Brass	3	830,000
(8) Electrical Equip.	3	1,808,069
(9) Electronics & Communication Equip.	4	6,138,408
(10) Industrial & Agricultural Equip.	32	35,105,526
(11) Iron & Steel, Ferroalloys, etc.	21	5,101,582
(12) Leather & Leather Prods.	4	1,321,190
(13) Lumber & Lumber Prod.	3	1,528,000
(14) Misc. Metals & Minerals	3	1,810,000
(15) Ordnance & Shipbuilding	9	10,700,610
(16) Pulp & Paper	5	50,003,060
(17) Railroad Equip.	0	0
(18) Rubber	1	435,000
(19) Scientific & Tech. Equip.	3	11,628,850
(20) Textile	6	31,776,945
(21) Tin, Lead, Zinc	1	132,900
(22) Printing & Publ.	0	0
(23) Oil & Gas Field Mach.	4	2,955,710
TOTAL	184	266,705,670

All Projects Granted Third Quarter Allotments

TABLE II

CATEGORY	NO. PROJECTS	EST'D COST
(1) Aircraft	24	138,207,752
(2) Aluminum, Magnesium	10	48,877,073
(3) Building Materials	6	9,968,724
(4) Chemicals	57	130,239,019
(5) Consumer Goods	7	1,818,872
(6) Containers & Packaging	5	1,361,255
(7) Copper & Brass	3	830,000
(8) Electrical Equip.	4	4,770,069
(9) Electronics & Communication Equip.	8	21,715,947
(10) Industrial & Agricultural Equip.	41	40,545,697
(11) Iron & Steel, Ferroalloys, etc.	28	9,198,632
(12) Leather & Leather Prod.	4	1,321,190
(13) Lumber & Lumber Prod.	4	3,378,000
(14) Misc. Minerals & Metals	3	1,810,000
(15) Ordnance & Shipbuilding	16	24,390,987
(16) Pulp, Paper, Paperboard	10	110,283,289
(17) Railroad Equip.	0	0
(18) Rubber	3	3,628,510
(19) Scientific & Technical Equip.	4	14,784,600
(20) Textile	7	33,026,945
(21) Tin, Lead, Zinc	1	132,900
(22) Printing & Publ.	0	0
(23) Oil & Gas Field Mach.	4	2,955,710
TOTAL	247	503,245,371

Latest Steel Inquiries, Awards

Fabricated steel awards this week include the following:

3329 **Tons,** Boston, Mass., structural carbon and silicon steel for superstructure J. F. Fitzgerald Expressway. Bethlehem Steel Co., Bethlehem, low bidder.

2503 **Tons,** Boston and Chelsea, Mass., steel superstructure with concrete deck and bascule draw with open grid deck of Andrew P. McArdle Bridge, American Bridge Div., U. S. Steel Co., Boston, low bidder.

Fabricated steel inquiries this week include the following:

137 **Tons,** Northampton County, Pa., divided highway, service roads and ramps, two concrete bridges, one I-beam bridge. Pennsylvania Dept. of Highways, Harrisburg, Pa. Bids to Aug. 29, 1952.

658 **Tons,** Boston, Mass., construction of viaduct and roads. J. J. Storrow Memorial Drive, vicinity of Charlesgate East and Charlesgate West, Charles River Reservation. C. J. Maney Co., Inc., Somerville, Mass.

Reinforcing bar awards this week include the following:

220 **Tons,** Newbury, West Newbury and Newburyport, Mass. Five bridges and bituminous concrete. A. V. Taurasi Co., Inc., Somerville, Mass., low bidder.

445 **Tons,** Boston, Mass., underpass and roadways at Charles St. between Poplar and Lowell St., Charles River Reservation. Coleman Brothers Corp., Boston, low bidder.

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COPPER: Consumers Will Get More

September copper allocations are larger than August allotments . . . But less than July issue . . . Consumers who did not receive full quotas in August will be given top priority.

Consumers of domestic refined copper will receive larger allocations in September than in August. But the new rations will be smaller than those issued in July, National Production Authority warns.

Allocations are earmarked for production on brass mill, copper wire mill, foundry, and miscellaneous products.

Because a few companies did not get all of their authorized orders placed for delivery in August, the suffix "X" will be tagged to their allocation orders for September allotments.

Following a pattern established with July copper allocations, September allotments are in two parts: Domestic refined copper, and other (foreign) refined copper.

Following table shows average monthly allocation quotas, plus July, August, and September allocation quotas of refined copper for production of brass mill, copper wire mill, foundry, and miscellaneous products and purposes.

Refined Copper

Short Tons—Copper Content

Item	PRODUCTS Brass Mill	Copper Wire Mill	Foundry
Monthly Average			
Aug. '51-June '52	49,550	52,962	5,958
July			
Domestic	37,327	38,233	4,440
Other	24,884	25,489	2,960
Total	62,211	63,722	7,400
August			
Domestic	33,811	34,631	3,122
Other	22,540	23,087	2,081
Total	56,351	57,718	5,203
September			
Domestic	35,247	36,103	3,243
Other	23,486	23,914	2,162
Total	58,733	60,017	5,405

Suppliers of brass mill products should be in a better position to fill demands from their warehouse customers during the weeks ahead as the result of a new National Production Authority Order (Dir. 1 to M-82) permitting them to increase inventories.

Revised order permits distributors of brass mill products to place, prior to Oct. 1, authorized controlled material orders for quantities of materials over those normally permitted.

This means that about 2.5 million lb of additional products should be moving through the hands of distributors during the rest of this month and in September. It is estimated that this quantity is in direct proportion to the increase of total brass mill products now being produced as a result of the improved copper supply.

COAL CONFAB: Edward G. Fox (left), president, Philadelphia & Reading Coal & Iron Co., and United Mine Workers Vice-President Thomas Kennedy meet in New York in an attempt to hammer out a new contract for 75,000 hard coal miners.

Aluminum Order Change Studied

National Production Authority is considering amendment of its aluminum distributors order (NPA order M-88) to permit ordering of increased amounts from mills, as well as the right to negotiate with mills for the product mix they need.

Aluminum distributors are now allowed to replenish inventories only with the items they sell. Proposed amendment would permit distributors to order each quarter 120 pct of one-fourth of the amount of aluminum of the same forms and shapes received from domestic producers during 1950. Under the plan, mills would be required to ship the greater amounts during fourth-quarter 1952 and succeeding quarters.

Proposal also would permit distributors to enter into agreements with producers for quantities in excess of the 120 pct amount without further clearance from NPA.

Industry is telling NPA that the plan would go far toward restoring the balance between warehouse inventories and customers' demands. Inventories today include too much of some products and not enough of others.

Oil Country Goods Curbs Lifted

Strike-imposed restrictions on delivery of oil casing and tubing from warehouse stocks now have been lifted by revocation of Dir. 1 to Sched. 2, M-6A.

Effect of the revocation is to permit deliveries of casing and tubing from field warehouses, known as M-6A stocks, to enable oil and gas operators who drilled from one to

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USS

UNITED STATES STEEL

20 wells during the 12-month base period to carry out regular drilling operations.

Deliveries now may be made to operators who hold authorizations bearing the allotment symbol H-2, issued by Petroleum Administration for Defense for third quarter 1952.

Aircraft Steel Rules Clarified

A new National Production Authority ruling clarifies the restrictions on sales of aircraft-quality alloy steel products (NPA M-6A, Sched. 1, as amended.)

Amended order makes it clear that aircraft-quality alloy steel products must be incorporated into orders placed pursuant (1) to a military program bearing the allotment symbol A-4, A-5, or A-7, where required by specifications, or (2) under a program bearing the allotment symbol E2, or for use in gas turbine and aircraft-type internal combustion engines for use on naval vessels.

Industry Controls This Week

Cars—Rev. 1, CPR 83 establishes a method for auto dealers to figure out their own ceilings and conditioning charges.

Controlled Materials—Amend., Dir. 3, CMP Reg. 1 provides that users are not required to reduce delivery orders for carbon steel, copper or aluminum below a carload lot.

Brass—Dir. 1, M-82 permits distributors of brass mill products to acquire increased quantities of such products to strengthen their inventories.

Electric Utilities—Amend. M-50 enables electric utilities to get full fourth quarter and advance quarterly allotments of controlled materials for "minor requirements."

Freight Cars—Amend. M-95 requires manufacturers of locomotives, railroad industrial and freight cars to report proposed production and delivery of equipment for the rest of the fiscal year to NPA.

Machine Tools—Machine tools, construction equipment, power equipment and railroad machinery are removed from controls of Dir. 4, CMP Reg. 3.

Machinery—Amend. 36, CPR 30 and Amend. 12, CPR 67 expand the meaning of pricing orders concerning producers and resellers of machinery and related manufactured goods.

Manufacturers — Amend. 37, CPR 30 allows multi-unit corporate manufacturers to continue treating their corporate establishment as a single unit in making reports on OPS Form 8.

Pipe — Amend. 5, CPR 98 enables sellers of reconditioned, reusable, boiler and pressure tubes to charge customary pre-Korea differentials for hydrostatic testing, turbinizing and special crop ending tubing.

Platinum — Amend. M-54 permits manufacturers of jewelry and other items on the prohibited list to receive from refiners for re-use all platinum reclaimed from their platinum scrap materials.

Sulfur—Amend. M-69 permits sulfur inventories to be increased to a 60-day supply. Revoc. M-94 removes distribution of sulfuric acid from NPA restrictions.

Steel—Dir. 4, CMP Reg. 1 allows foreign and used steel to be acquired ex-quota. Revoc. Dir. 1, Sched. 2, M-6A removes some restrictions on delivery of oil country tubing and drill pipe by steel producers. Amend. Sched. 1, M-6A requires steel producers to make monthly shipments of aircraft quality alloy steel product to distributors on a specified basis. Dir. 19, CMP Reg. 1 and Dir. 7 CMP Reg. 6 frees carbon conversion steel from CMP restrictions. Rev. 1, SR 100, GCPR increases ceiling prices on steel mill products.

Tin—Amend. 13, CPR 31 requires importers and resellers of tin to report the class of their buyers and the unit markup used.

Defense Contracts

Contracts Reported Last Week

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Valves, 109759 ea, $227,249, Crane Co., Philadelphia.

Casters, 6000 ea. $27,300, Service Caster & Truck Corp., Albion, Mich.

Replenishment of motor vehicle parts, 7400 ea, $28,347, Columbian Steel Tank Co., Kansas City.

Replenishment of hardware, 349000 ea, $26,462, The Crescent Co., Inc., Pawtucket, R. I.

Replenishment of motor vehicle parts, 8500 ea, $111,971, Willys-Overland Motors, Inc., Toledo.

Replenishment of motor vehicle parts, 2786 ea, $444,970, The Troy Sunshade Co., Troy, Ohio.

Replenishment of motor vehicle parts, 5000 ea, $41,528, S. J. Corbett Co., Detroit.

Replenishment of motor vehicle parts, 47500 ea, $255,075, S. J. Corbett Co., Detroit.

Replenishment of motor vehicle parts, 9000 ea, $18,444, Chrysler Corp., Detroit. *A. H. Hilverkus.*

Replenishment of motor vehicle parts, 5000 ea, $36,200, Active Gear Co., Inc., Chicago.

Replenishment of hardware, 45653 ft, $430,891, Magnus Metal Corp., New York.

Replenishment of tools, 4838 ea, $48,580, Auto-Test Inc., Chicago.

Replenishment of motor vehicle parts, 85 ea, $26,851, McCabe-Powers Auto Body Co., St. Louis.

Replenishment of motor vehicle parts, 6450 ea, $77,271, Hercules Motors Corp., S. E. Canton, Ohio.

Replenishment of hardware, 16636 shts, $97,765, Jones & Laughlin Steel Corp., Pittsburgh.

Replenishment of motor vehicle parts, 74 ea, $238,632, Fruehauf Trailer Co., Detroit.

Replenishment of tank & combat vehicle parts, 8085 ea, $1,077,632, Northwestern Auto Parts Co., Minneapolis.

Replenishment of motor vehicle parts, 2200 ea, $248,116, Diamond T Motor Car Co., Chicago.

Replenishment of motor vehicle parts, 5250 ea, $125,212, United Auto Parts Co., Inc., Kansas City.

Replenishment of small arms parts, 2000 ea, $103,360, Tool Industries, Detroit.

Replenishment of tank & combat vehicle parts, 9000 ea, $99,450, GMC, Indianapolis, *H. S. Bowden.*

Replenishment of hardware, 5434 ft, $28,457, Jones & Laughlin Steel Co., Pittsburgh.

Replenishment of tank & combat vehicle parts, 1400 ea, $56,056, Loner-Wood Tool & Eng'g Co., Detroit.

Replenishment of tank & combat vehicle parts, 1320 ea, $1,783,188, American Locomotive Co., Schenectady.

Replenishment of tank & combat vehicle parts, 120 ea, $95,400, Acme Chair Co., Reading, Mich.

Replenishment of tank & combat vehicle parts, 400 ea, $42,758, Bayley Products Co., Detroit.

Replenishment of hardware, 194880 ft, $31,985, U. S. Steel Co., Detroit.

Replenishment of motor vehicle parts, 12000 ea, $66,000, The C. A. Olsen Mfg. Co., Elyria, Ohio.

Replenishment of tools, 775 ea, $42,327, Algonac Mfg. Co., Algonac, Mich.

Replenishment of motor vehicle parts, 2700 ea, $27,534, MacKenzie Awying Co., Detroit.

Replenishment of tools, 2100 ea, $87,998, Hawk Tool & Eng. Co., Clarkston, Mich.

Replenishment of tools, 8500 ea, $270,-980, Lincoln Engineering, St. Louis.

Replenishment of tools, 81800 ea, $71,-575, Crawford Mfg. Co., Richmond, Va.,

Replenishment of tank & combat vehicle parts, 300 ea, $63,000, Rett Products Co., Detroit.

Replenishment of tank & combat vehicle parts, 13800 ea, $85,638, American Generator & Armature Co., Chicago.

Replenishment of tools, 3164 ea, $121,181, The Colson Corp., Elyria, Ohio.

Replenishment of tools, 515 ea, $175,723, McDermott Steel Spec., West Haven, Conn.

Replenishment of motor vehicle parts, 85 ea, $222,750, Gramm Trailer Corp., Lima, Ohio.

Trailer, mount. M20, 913 ea, $526,151, Great American Inds, Inc., Oneonta, N. Y.

Truck cargo and pickup, 467 ea, $682,-609, Willys-Overland Motors, Inc., Toledo.

Replenishment of tools, 24800 ea, $122,-400, The Shaler Co., Waupun, Wis.

Replenishment of tools, 37700 ea, $121,-771, Gray Co., Inc., Minneapolis.

Replenishment of tools, 21500 ea, $212,-850, S-S Co., Brooklyn.

Replenishment of hardware, 68000 ea, $100,580, Bearing Co. of America, Lancaster, Pa.

Replenishment of tools, 12900 ea, $148,-866, Binks Mfg. Co., Chicago.

Replenishment of tools, 96900 ea, $166,-593, Bryan Mfg. Co., Frankfort, Kentucky.

Grinder, Electric, 594 ea, Baldor Electric Co., St. Louis.

Wheel, wire, steel, 30000 ea, $70,650, The Osborn Mfg. Co., Cleveland.

Wheel, wire, steel, 10000 ea, The Osborn Mfg. Co., Cleveland.

Wheel, wire, steel, 15000 ea, The Osborn Mfg. Co., Cleveland.

Lathe engine, 105 ea, $180,745, South Bend Lathe Works, South Bend, Ind.

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CHROMEL-ALUMEL, Cat. No. 1231(3-A), 14 ga., STRANDED-DUPLEX, each wire felted asbestos, Asbestos-yarn braid overall.

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IRON-CONSTANTAN, Cat. No. 1236-C, 14 ga., STRANDED-DUPLEX, each wire felted asbestos, Asbestos-yarn braid overall.

COPPER-CONSTANTAN, Cat. No. 1235-A, 14 ga., SOLID-DUPLEX, each wire cotton, rubber, weatherproof braid, lead sheath overall.

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Industrial Briefs

New Plant—SHAKEPROOF INC., a division of Illinois Tool Works, Chicago, has opened a new plant in Des Plaines, Ill., for production of metal fastening devices and special precision stampings.

Ground Broken—FOOTE MINERAL CO. broke ground recently for its new lithium plant at Sunbright, Va.

To Be Built—A new plant for the producton of zirconium and hafnium sponge metals is to be built by THE CARBORUNDUM METALS CO., INC., a subsidiary of The Carborundum Co.

Awarded—THE FRANKLIN INSTITUTE of the State of Pennsylvania has awarded its Certificate of Merit to Arthur M. Stoner, of West Hartford, Conn., for his development of a chuck and collet combination for lathes to hold cylindrical work being machined.

Branch Office—ARTHUR D. LITTLE, INC., has opened a branch office at Railway Exchange Bldg., St. Louis.

Distributor Named — ALLIS CHALMERS MFG. CO. has named The Ben Beverly Equipt. Co., Inc., Long Island City, N. Y., a distributor.

Moved — WELTRONIC INDUCTION HEATING CORP. has moved into its new plant at 10230 Capital Ave., Detroit. This organization is devoting all of its efforts to building high frequency heating equipment for all fields in the metalworking industry.

Largest Contract Awarded — TENNEY ENGINEERING, INC., Newark, has been awarded one of the largest single contracts yet placed for environmental test equipment by Frankford Arsenal.

New Division — YALE & TOWNE MFG. CO. has announced the acquisition of American Sintered Alloys, Inc. of Bethel, Conn., which is being operated as one of its manufacturing divisions.

Transferred—The production of hot-rolled stainless steel will be transferred to the Vandergrift, Pa., plant of U. S. STEEL CO. This steel was formerly rolled on the hot mills at Wood Works in McKeesport.

New Address—Government and Industrial Div., PHILCO CORP., has established its headquarters at 4700 Wissahickon Ave., Philadelphia.

Annual Meeting—Southern Ohio Section of the NATIONAL OPEN-HEARTH COMMITTEE is holding its annual meeting at the Deshler-Wallick Hotel, Columbus, on Oct. 3 and 4.

Shipment Completed — CHICAGO FREIGHT CAR & PARTS CO. has just completed shipment of 40 ballast-type hopper cars to be used in the development of the Cerro Bolivar mine in Venezuela.

Appointed — COPES-VULCAN DIV., Continental Foundry & Machine Co., Erie, Pa., has appointed Carl Grimes & Co., Des Moines, as Iowa representative.

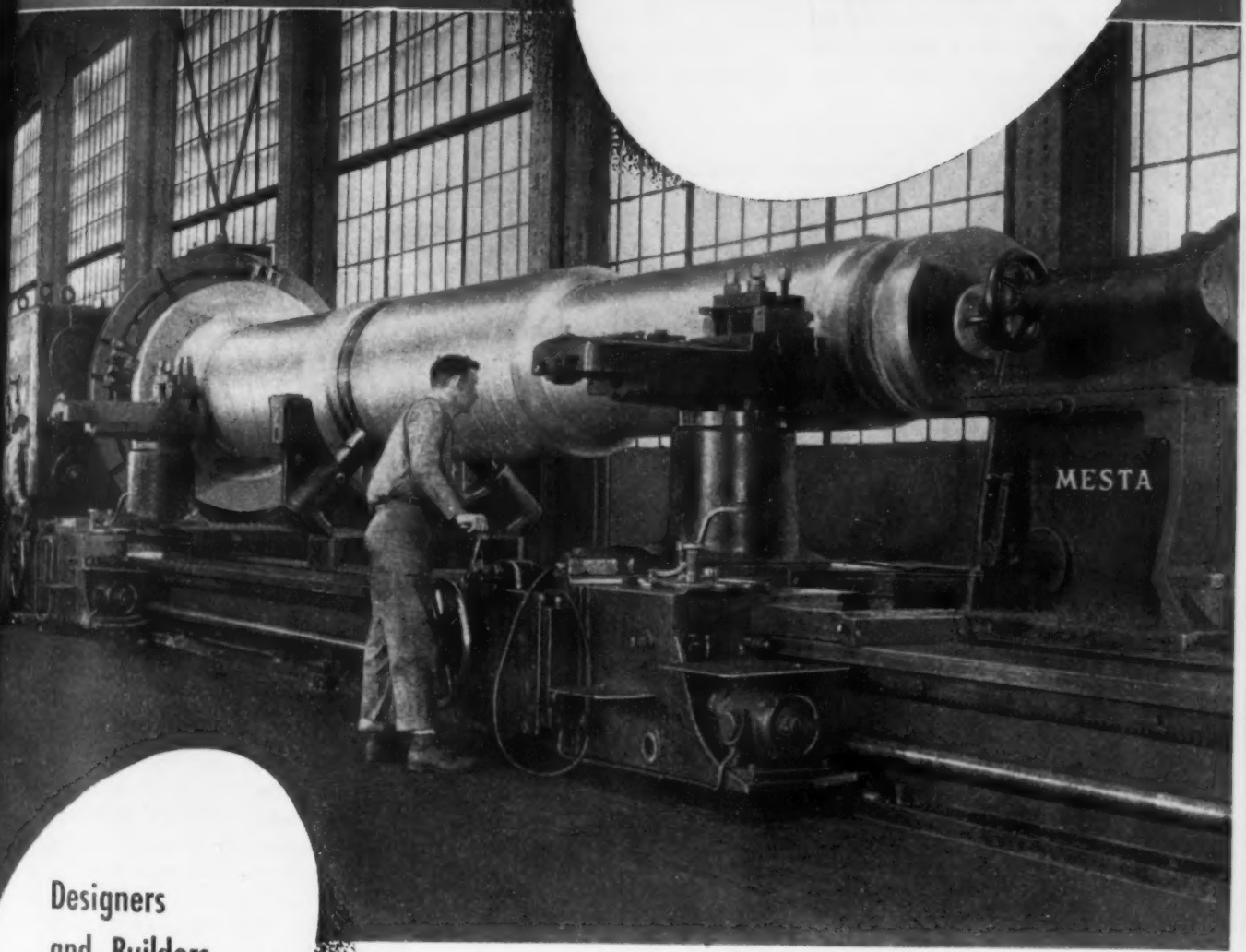
Fund Established—A fellowship fund to help promising young engineers and scientists of the WESTINGHOUSE ELECTRC CORP. continue their studies at a graduate level has been established in honor of the late Leon R. Ludwig, inventor and Westinghouse engineering executive.

Sheet Steel Plant—WESTEEL PRODUCTS LTD., Toronto, has started work on the erection of a $700,000 plant addition to house its sheet steel products division. Unit will cover 81,000 sq ft and is expected to be completed early next year.

MACHINE SHOPS at MESTA

LATHES...

Machining Forged Steel Rotor Shaft on a MESTA Heavy Duty Lathe



Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY
Pittsburgh, Pa.

Pay Rise Set for Auto Workers

Cost of living index increase means wage adjustment for UAW members . . . Probable boost under escalator clause 3¢ per hr . . . Living cost raises now total 26¢ per hr—By *R. D. Raddant*

Approach of September once more turned all eyes in the automotive world, manufacturer and worker alike, to the cold figures of Bureau of Labor Statistics.

What they saw was inevitable. Rising cost of living once again resulted in raises of probably 3¢ per hr for more than 1 million auto workers covered by United Automobile Workers (CIO) escalator clauses.

Increase, effective Sept. 1, will be based on the consumer price index as of July 15. Under the famous escalator clause, hourly wages rise and fall each quarter with the BLS index. Salaried employees are also granted benefits in proportion to the hourly wage fluctuation. Lump sum payments to salaried personnel will average over $130.00.

Up 26¢—Under the contracts between UAW and auto producers, auto workers will have gained 26¢ per hr in cost-of-living wage adjustments since May, 1948, when the first escalator agreements were reached.

It was a different story June 1 this year when auto workers took a single cent cut as the BLS index took a slight dip on May 15, the date at which second quarter wages were determined.

The forthcoming pay raise was considered inevitable almost as soon as the third quarter got under way. By that time, the May drop had already been wiped out and prices continued to creep up throughout the period.

Neutral — Prospective pay increase caused neither grumbling on the part of industry nor any perceptible cheer among workers. It means another increase in costs to the auto producers at a time when materials costs are also in for upward adjustments. Auto workers feel it will be more than absorbed by the still climbing cost of living.

Contracts have almost 3 years to run and quarterly adjustments have now become a regular and accepted occurrence to both workers and industry. Under its terms, the auto industry has enjoyed probably the longest period of labor peace in its history.

Price Rise—Auto prices also received a slight boost last week, but not at the factory level.

The occasion for the increases was a modified Ceiling Price Reg. 83 that went into effect Aug. 23. Modifications, in effect, end specific ceilings on new cars and permit dealers to reinstate full pre-Korean discounts and preparation charges on new model automobiles.

It will mean a 1 pct retail price increase on cars sold by dealers exercising the discount recovery option. This is strictly up to the individual dealer who can now calculate his own markup. It may be pegged on one of two optional periods: Month before the outbreak of the Korean war or period from Jan. 26 to Feb. 24, 1951, the month after prices were frozen.

Conversion Bonus — Conversion steel "bonuses" of 500 tons to each steel user just about put the auto industry over the hump for the remainder of the year.

The concession, which enables steel consumers to use up to 500 tons of conversion steel without having it substracted from regular allotments, lies behind brisk auto production rates forecast for the last 3 months of 1952.

The industry had been told it could expect only 80 pct of the steel allotted for the third quarter in the final 3 months. This would have spelled a gloomy production rate and increased unemployment.

The 500-ton bonus actually means little in itself to any of the large auto producers. However, to parts suppliers and smaller manufacturers it means a great deal more. Spread across the auto industry it could mean a difference of almost 250,000 cars.

With a 500-ton limitation, the bonus wasn't exactly what auto manufacturers had hoped for. But with provisions to ask additional conversion steel up to 40 pct of the quantity of regular steel allowed, bottlenecks could be avoided.

Conversion is expensive and just how much this will mean in production costs is difficult to estimate. Regardless of the cost, however, it is looked on as an excellent crutch to keep production moving along.

For Sale—It looks as if Buick will place the new Skylark sports car on the market, probably in 1953. The slick sports car was

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS	TOTAL
Aug. 23, 1952	88,596*	22,043*	110,639*
Aug. 16, 1952	25,923	10,967	36,890
Aug. 25, 1951	107,131	31,666	138,797
Aug. 18, 1951	99,893	29,768	129,661

*Estimated

Source: *Ward's Reports*

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HAS REVOLUTIONIZED BLAST CLEANING FOR 26 YEARS

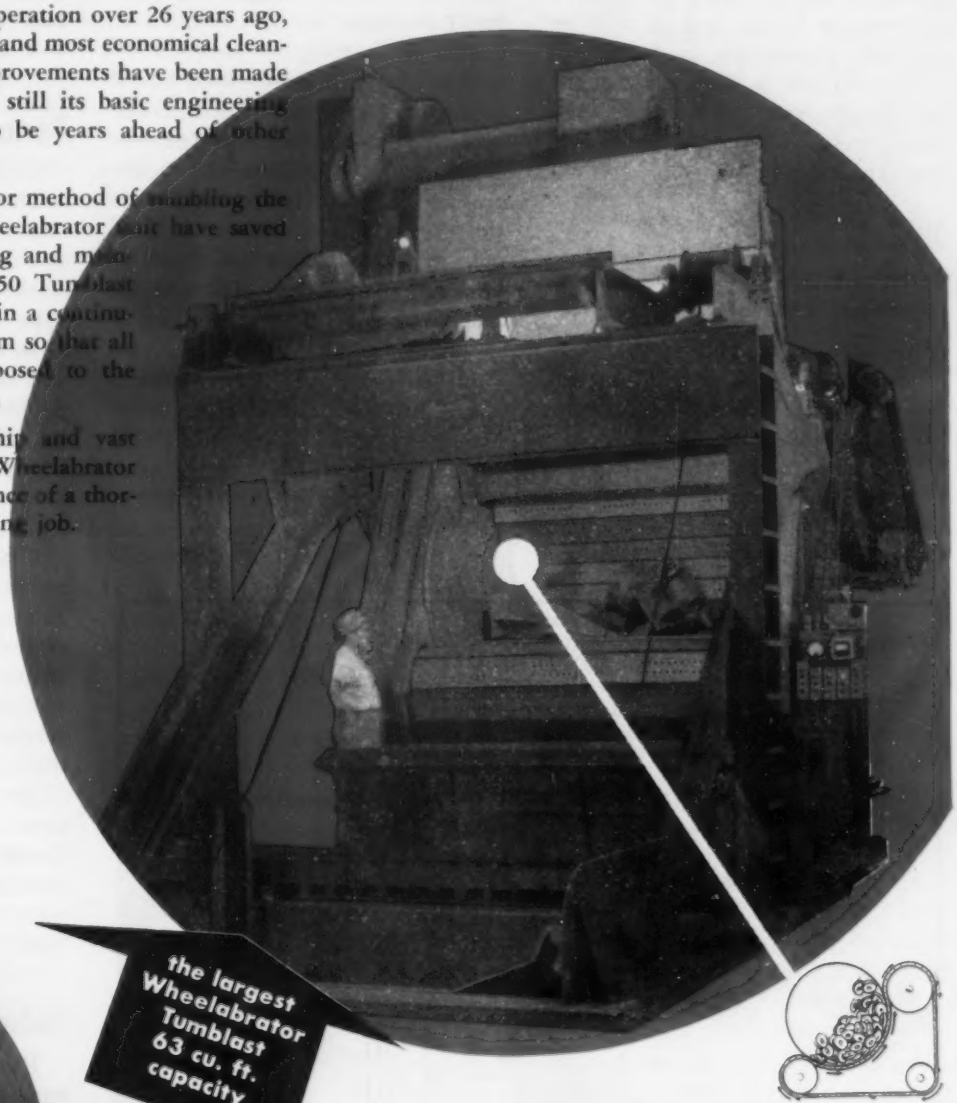
- **FIRST** *with endless belt conveyor*
- *4350 ENTHUSIASTIC USERS*

The original airless batch mill that transformed metal cleaning to a mass production operation over 26 years ago, is still the fastest, most thorough and most economical cleaning method today. Constant improvements have been made in the Wheelabrator Tumblast, still its basic engineering features have always proved to be years ahead of other designs.

For instance, the endless conveyor method of tumbling the work and the incomparable Wheelabrator unit have saved thousands of dollars in operating and maintenance costs for more than 4350 Tumblast users. Work is gently cascaded in a continuous cycle beneath the blast stream so that all surfaces of every piece are exposed to the full effect of the cleaning action.

American's engineering leadership and vast experience with the proven Wheelabrator Tumblast is your absolute assurance of a thorough, fast and economical cleaning job.

Catalog No. 254-A is a comprehensive guide to airless batch mill cleaning. It describes the advantages of the Tumblast and illustrates the 8 standard sizes as well as the Continuous Automatic Tumblast. Send for your copy today.



the largest Wheelabrator Tumblast 63 cu. ft. capacity

the smallest Wheelabrator Tumblast 1 cu. ft. capacity

there's a Wheelabrator Tumblast for every cleaning job
8 sizes to choose from

American

WHEELABRATOR & EQUIPMENT CORP.

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shown off recently with the statement that production plans would depend on public reaction.

Ivan L. Wiles, Buick general manager and GM vice-president, now reports that "Buick has received extremely favorable reaction" to the car where it has been shown.

"Dealers everywhere have had queries about when it would be put on sale," Mr. Wiles said, "and a number of dealers have even accepted retail orders for future delivery in hopes that it will be put into production in 1953."

The Skylark is built on a regular Roadmaster chassis with down-swept doors, full cutaway fenders and wire wheels.

QUOTAS:

NPA reshuffles carmakers' controlled materials allocations for last period.

Reshuffling by the government of automobile production quotas means a 66,000-unit increase for the four largest manufacturers during 1953, but total industry output is to remain unchanged.

National Production Authority ordered the revised manufacturing quotas into effect for the fourth quarter after it found that the seven smaller manufacturers were not using all the steel, copper, and aluminum to which they were entitled.

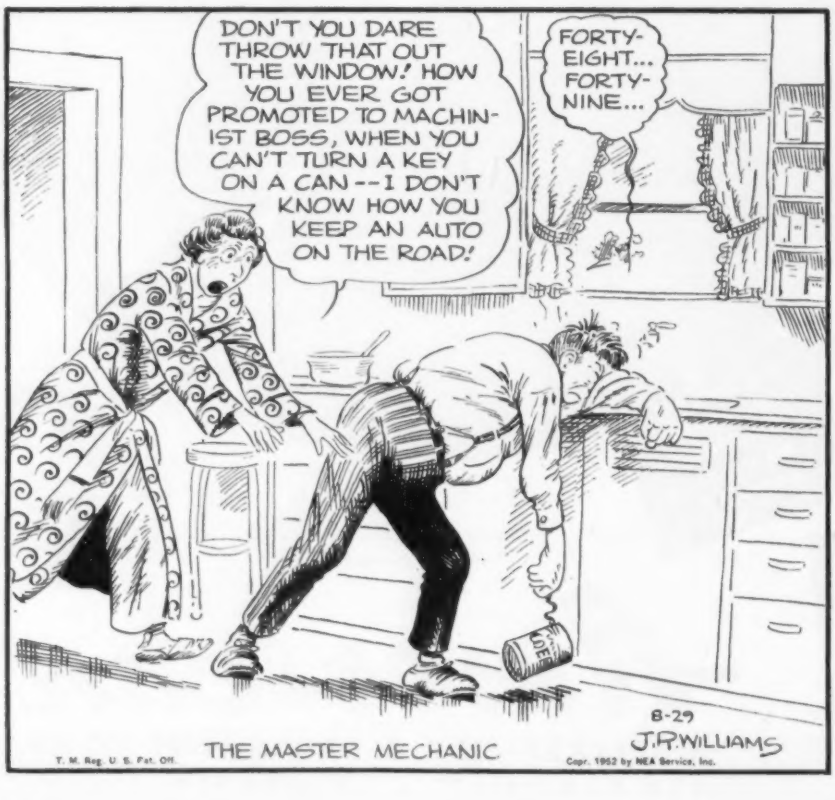
Largest share of materials still goes to General Motors. Chrysler continues in second place, despite efforts of Ford to take over the No. 2 position.

Who Gets What?—Revised quotas give GM 41.62 pct of the controlled materials allotted the entire industry. This is an increase of 0.62 pct. Chrysler's share climbs from 21.43 to 21.76 pct. Ford's quota rises from 21 to 21.31 pct, and Studebaker's from 4.13 to 4.19 pct.

Firms taking cuts are Nash, Hudson, Kaizer-Frazer, Packard, Willys-Overland, Crosley, and Checker Cab. Nash allotment dropped from 3.45 to 3.42 pct; Hudson from 2.93 to 2.52 pct; Kaizer-Frazer from 2.47 to 2 pct; Packard 2.09 to 1.88 pct; Willys 1.21 to 1.20 pct. Crosley previously received 0.21 pct and Checker 0.08 pct. In the future, they will receive a combined total of 0.10 pct.

None of the manufacturers are completely satisfied with the new quotas, it is reported. The larger manufacturers feel they should have received larger increases, and the smaller firms say they lost too much.

THE BULL OF THE WOODS — By J. R. Williams


DON'T YOU DARE THROW THAT OUT THE WINDOW! HOW YOU EVER GOT PROMOTED TO MACHINIST BOSS, WHEN YOU CAN'T TURN A KEY ON A CAN--I DON'T KNOW HOW YOU KEEP AN AUTO ON THE ROAD!
FORTY-EIGHT... FORTY-NINE...
8-29
J.R.WILLIAMS
T. M. Reg. U. S. Pat. Off.
THE MASTER MECHANIC
Copr. 1952 by NEA Service, Inc.

Device Solves Design Problems

Goodyear Aircraft Corp. has developed a new electronic "brain" that can evaluate many advance designs of piston-driven vehicles without the necessity of prototype models.

Device, called the L3 GEDA, can test and evaluate engineering problems by simulation. Goodyear reports it is capable of solving problems of motion and control either by direct simulation or by mathematical equations.

The analyzer solves problems in terms of voltages and wave forms which are transcribed onto paper and interpreted by trained technicians. Problems of direct simulation are answered through electrical and mechanical circuits.

By substituting different voltages in the L3 GEDA for the different parts of an equation, any problem of motion that can be translated into a mathematical equation can be solved, it's said.

Hudson Adds Anti-slip Jack Pad

Hudson has added a new feature to its cars that is guaranteed to reduce the profanity used by a motorist with a flat.

The feature, whose purpose is really safety, not morals, is an anti-slip jack pad built into the corners of a Hudson's frame. The pads are of hardened steel and welded directly to the frame at points most convenient for use.

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Magnifying Glass Check of Pipe Needs

Washington double-checks oil field operators' requests for pipe . . . Ask everything but birth certificates . . . Charge misuse of applications . . . Fuel shortage in East?—By G. H. Baker.

Applications from oil field operators for allocations of pipe are being checked and double-checked as never before.

Fine-tooth comb treatment now being administered in Washington is a direct result of the steel strike and the crushing blow it dealt the already-puny inventories of oil-country goods existing at the time the strike started.

Hardest hit by the pipe shortage are wildcat operators. This year's goal of 50,000 new oil wells now appears to be over-optimistic, in the light of the steel strike. Starts on 45,000 new wells seem to be the most that can now be expected in 1952.

Canvass for Pipe—Larger operators, complaining bitterly of the double handicap of short supplies plus government detective-work on their applications for pipe, are hammering on dozens of doors at National Production Authority and Petroleum Administration for Defense—but to little avail.

Nub of all drilling complaints is that there just isn't enough pipe to go around. And there probably won't be enough to take care of all drilling requirements for at least several more months. PAD does not expect drilling operations in general to reach their pre-strike level until early next year.

Charges Misuse—PAD claims its new policy of tight-screening all pipe applications arises from misuse of the application forms by some operators. Pipe intended for wildcatting has been diverted to other uses by companies exercising an unusual degree of initiative in applying for pipe allotments, PAD indicates.

At least part of the current shortage can be traced to misuse of the supplies earmarked for wildcatting, PAD says. Drawing from these supplies on the basis that they needed the pipe for wildcatting, these few operators were instead diverting the pipe from the emergency stocks to other purposes, it is reported.

Red Tape Mounts—In a move to dam this drain on the already-meager supplies available to wildcatters, PAD's J. Ed. Warren is instructing his staff to "get tough" with applications from "regular" (i.e., non-wildcat) operators. In many instances, applicants are requested to send copies of their lease agreements—and in some cases even their drilling contracts—to Washington to prove legitimacy of the applications.

Crude oil productive capacity was 7,200,000 bbls per day on Jan. 1. Prior to the strike, it had been planned to boost output, largely through wildcatters' efforts, to 7,722,000 bbls per day. Today, PAD hopes to see output nudged up to 7,609,000 bbls by 1953.

Even the loss of a potential 113,000 bbls per day is serious. But the industry and PAD will bring the re-adjusted goal within reach, Warren believes.

"But I can't. He already has his steel quota for this quarter."

Cold Inside?—East Coast factories, office buildings, and homes may be headed for a serious heating problem.

Government oil petroleum experts say refiners will have to step up production of fuel oil by 18 pct—and hold this high rate of output for at least 9 months—if adequate supplies are to be available to customers up and down the East Coast this winter.

PAD is advising refiners on the Gulf Coast and on the East Coast to push for maximum distillate production in the coming weeks.

Jobbers and markets are now receiving instructions to buy their winter heating oil early, and to fill up all available storage.

Another Pipeline—Transportation of heating oil to the East may also prove to be a real headache this winter. PAD has concluded that it will be necessary to complete at least one of the new pipelines out of West Texas. (The government approved construction of a Gulf to New York pipeline.) Transportation by tanker, however, is not going to be as tough as in past seasons. The number of new tankers that have gone into service in recent months has eased this phase of oil distribution.

Focal point in the PAD outlook is the fact that the East Coast has enjoyed relatively mild winters during the past 3 years. If this coming winter should turn out to be a "normal" or colder winter, dealers' stocks will rapidly drop to the critical point—unless refinery output is stepped up sharply between now and April.

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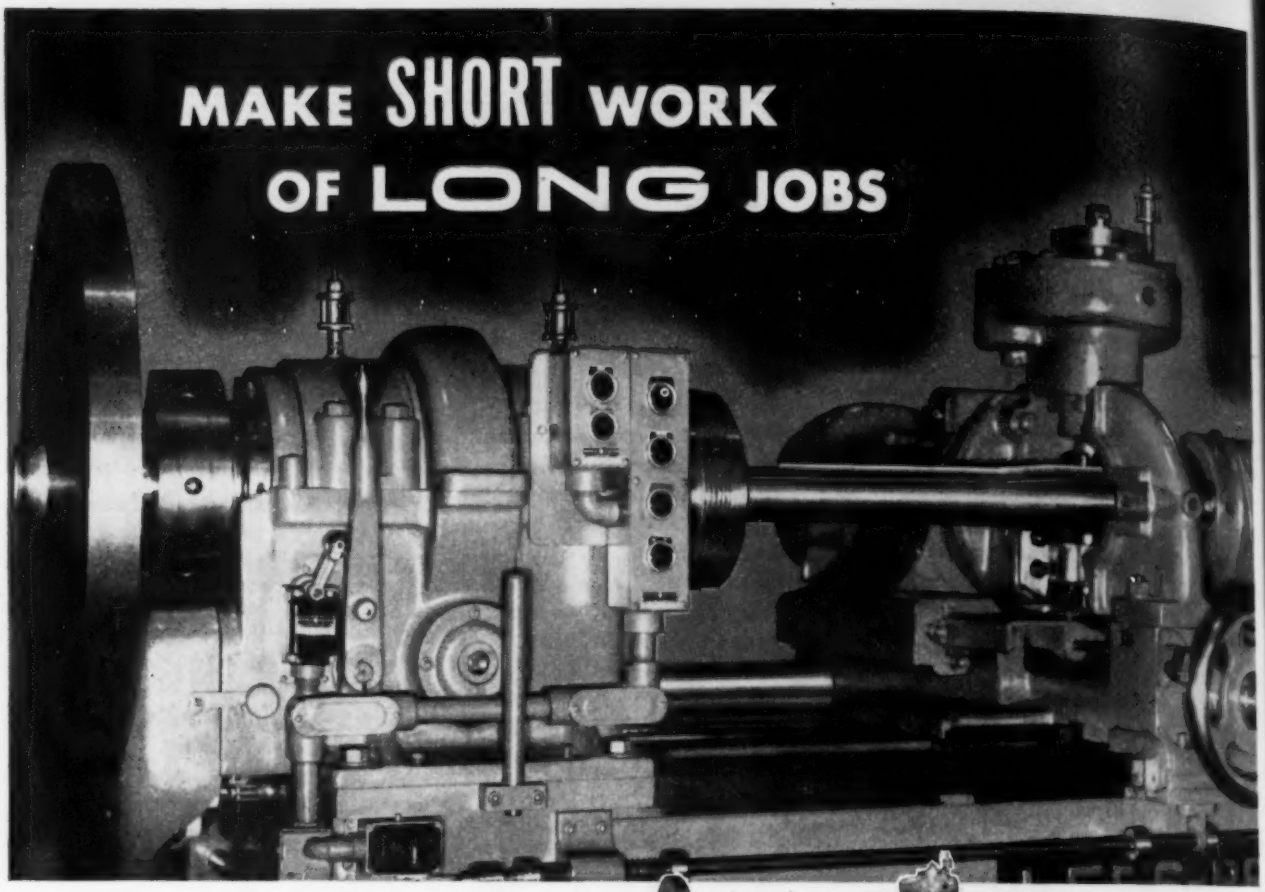
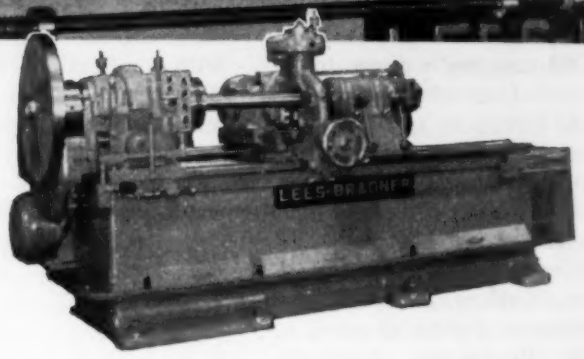
MAKE SHORT WORK OF LONG JOBS



with the Lees-Bradner *End Loading* SH SPLINE HOBBER



•The SH hobs splines up to 144".

The exclusive Lees-Bradner "feed through spindle" feature enables the SH spline hobber to handle long and bulky parts with maximum efficiency and speed. It also provides the necessary support for long splines of small diameter.

The SH will hob splines up to six inches in diameter and can handle spur and helical gears up to eight inches.

Let Lees-Bradner, the first name in hobbing, be your first thought when you have a hobbing problem. Your Lees-Bradner representative will be happy to consult with you without obligation.

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CLEVELAND 11, OHIO, U.S.A.

PRICES: Ready Pass-Through Order

Metal cost pass-through order will probably give manufacturers authority to pass on full materials costs . . . Must share part of labor and transportation costs—By R. M. Stroupe.

Government officials writing the new cost pass-through order that will apply to all manufacturers using steel, copper, and aluminum (THE IRON AGE, Aug. 21, 1952, p. 69) were grooming their entry early this week for a test explanation before the Office of Defense Mobilization's Stabilization Policy Committee.

Last week the National Advisory Board on Mobilization Policy, containing representatives of industry, labor, government, and the public, gave its approval to a formula permitting producers to pass along higher costs of the three metals. But consent by the board does not amount to final approval.

Equitable—A considerable number of industries have presented the Office of Price Stabilization with strong pleas for normal margin markups on the higher materials costs they expect to pass along, but it is unlikely OPS will agree. An agency source forecasts, however, that manufacturers will find wording of the materials pass-through authorization "very equitable."

Form of the order is expected to be a General Overriding Reg.

While the final order is not expected until next week, cost pass-through allowances OPS is considering run about 100 pct for materials, 75 to 100 pct for transportation and 50 pct for labor. (THE IRON AGE, Aug. 21, 1952, p. 155).

OPS insists manufacturers must absorb at least part of the higher costs of labor. In determining what price hikes an industry should have to compensate for wage increases granted, the agency proposes to use a so-called "streamlined" industry earnings standard.

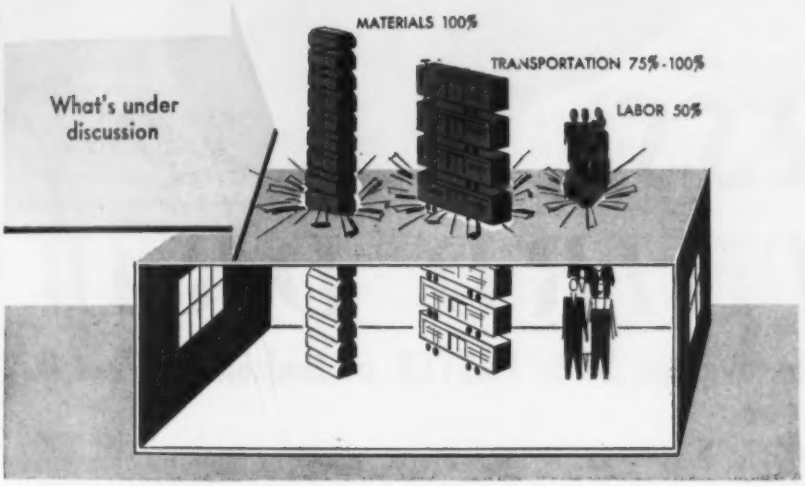
Requests Pile Up—Time-saving achieved by use of this standard will be only relative. Some 1800 requests for pricing relief under pass-through terms had piled up last week in the OPS Industrial Materials & Manufactured Goods Div. Even if this batch were only one-third as large, it could require weeks for OPS to assemble data from the applicants for use in its "streamlined" standard.

Whatever is done to relieve pressure at the manufacturing level will call for new decisions by distributors. Wholesalers and retailers will feel the urge to raise prices on durable items ranging from kitchen utensils to automobiles and farm machinery.

At the same time, they will be facing the problem of continued consumer resistance in certain lines. A markup high enough to compensate for increased costs of metal products could become a barrier against the greater sales volume which distributors feel they must have this winter.

Impact of higher durable goods prices that would be expected to follow the pass-through order is hard to compute on a dollar-and-cents basis. OPS itself is reluctant to name a firm figure, and points to the soft market for some metal items as the key to its belief higher price ceilings need not mean higher prices in every case.

OPS Is Considering Following Pass-Throughs



Defense Steel Priority Promised

Reassurance is offered by National Production Authority that contractors with unplaced third and fourth quarter orders for steel to be used in defense and atomic energy programs will get deliveries in time to meet production schedules.

Under an agreement with Munitions Board and Atomic Energy Commission, NPA says, requests for assistance in placing military and AEC authorized controlled materials orders will be considered as suitable for receiving highest priority treatment.

Requests for directives about expediting of steel deliveries will be confined to top-urgency military and AEC projects.

Contractors working in AEC programs and needing assistance should send their requests directly to AEC. Firms handling military contracts should present their requests for assistance to the pertinent military agency on form DD-536.

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On the third draw Multipress completes this .064 phosphorus bronze housing, precision-drawn and formed to 3-inch depth, hole in base centered in embossed ring.

Completed like this — by

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Deep-drawing jobs average 50% FASTER at Hudson Tool and Die

Multipress offers eight frame sizes... one to 50-ton capacities . . . manual or automatic controls . . . index-table, dial, and harmonic stock feeds . . . many other standard accessories for special needs.

With the smooth, rapid, *controlled action* of oil-hydraulic power, Multipress takes its usual big bite out of production costs for another new user — the Hudson Tool & Die Company, Newark, N. J. The company specializes in accurately drawn shapes of steel, phosphorus bronze, brass, and copper.

A 50-ton Multipress with standard punch and draw ring does *better* work in *fewer stages* than the press used previously — *with less metal fracture than before.* Draws average 20% deeper . . . production is up from 600 units per hour to an average of 900 per hour . . . quality is better than ever . . . highest safety is assured by dual hand-lever controls . . . and unskilled workmen get perfect results from the start because Multipress permits infinite adjustment of ram *pressure, speed* and *stroke* for each operation.

(Hudson Tool & Die already has a second Multipress on order, as this is written, and is planning for additional units in the near future.)

Other plants report equally remarkable savings and short cuts — not only on *drawing* jobs, but also in broaching, forming, bending, stamping, staking, crimping, flaring, riveting and many other operations. Write today for full information.

THE **DENISON** ENGINEERING CO.

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New Western Shell Plant Starts Up

Norris-Thermador's Riverbank, Calif., plant is second on Coast . . . Will make artillery shell cases for Army; may add Navy line later . . . Had been Alcoa project—*By T. M. Rohan.*

Western ordnance production added a second plant to the roster this week when the World War II aluminum plant at Riverbank, Calif., 90 miles southwest of San Francisco, made its first pilot shipment of cartridge cases. Plant will produce 75 mm, 90 mm and 105 mm cartridge cases for the Army. A Navy line may be added later.

Building was reconditioned and equipped by Bechtel Corp. of San Francisco for Norris-Thermador Corp., Los Angeles, who will operate it. Norris-Thermador also operates a plant in Vernon, Calif., which has made cartridge cases (currently 105 mm) since the beginning of World War II.

Alcoa-Built—At the Riverbank plant 750 people are now employed and about 75 will be added monthly for final employment of about 1800. Facility was built by Alcoa during World War II to produce 48,000 tons of aluminum pig per year. It never got into full production chiefly because the power demand of 864 million kw-hr could not be met. It was dismantled after the war and had been idle until this year.

The West's only other civilian large-caliber ammunition maker, Rheem Mfg. Co. of San Pablo, Calif., this week makes its first pilot shipment of 3-in. and 50-cal cartridge cases. Full production is expected to start in about 2 or 3 weeks with 200 additional employees making the total about 700.

Rheem is currently in full production on high priority 81 and 155-mm mortar shells. No shutdowns due to the steel strike have occurred but eastern steel must be brought in at higher cost

Tinplate Moving—Western tinplate was still running nip and tuck with canning factories to save the crop last week.

Tinplate pirated from American Can Co. Hawaiian factories and sent by chartered ship to California was speedily distributed up and down the coast to plants in shortest supply. Kaiser got the electrolytic portion of its new $20-million plant at Fontana, Calif., in full production and is hoping the good luck in avoiding breaking-in trouble will be with them for some time to come.

A crew of nine from U. S. Steel's Irvin Works is keeping production as high as possible. Five of the seven lines on the hot-dip portion, first to start up, are now in production. Remaining facilities should be in operation soon.

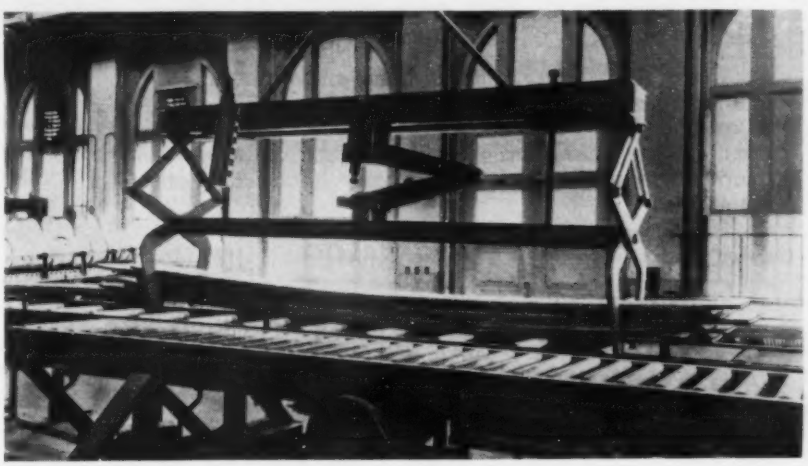
In Seattle the tinplate situation is tight but no crops have been lost. In some cases can manufacturers have to substitute sizes and types. Continental had a strike added to its trouble when 300 machinists walked out at the Troyer Fox cannery machinery plant to enforce a 20¢-per-hr wage demand.

Auto Assembly—Western automobile assembly operations were mostly back to full operation last week—some even getting in overtime. Unlike Detroit, western auto plants do no steel conversion but get all structural parts from main plants.

General Motors, Ford and Chrysler plants as well as the independents lagged behind Midwest plants by the expected week or 10 days shipping time in getting re-started. The Lincoln-Mercury plant at Los Angeles is making up for lost time with a 10-hr, 6-day-week schedule.

No other overtime operations have been announced so far but may be scheduled when supplies permit.

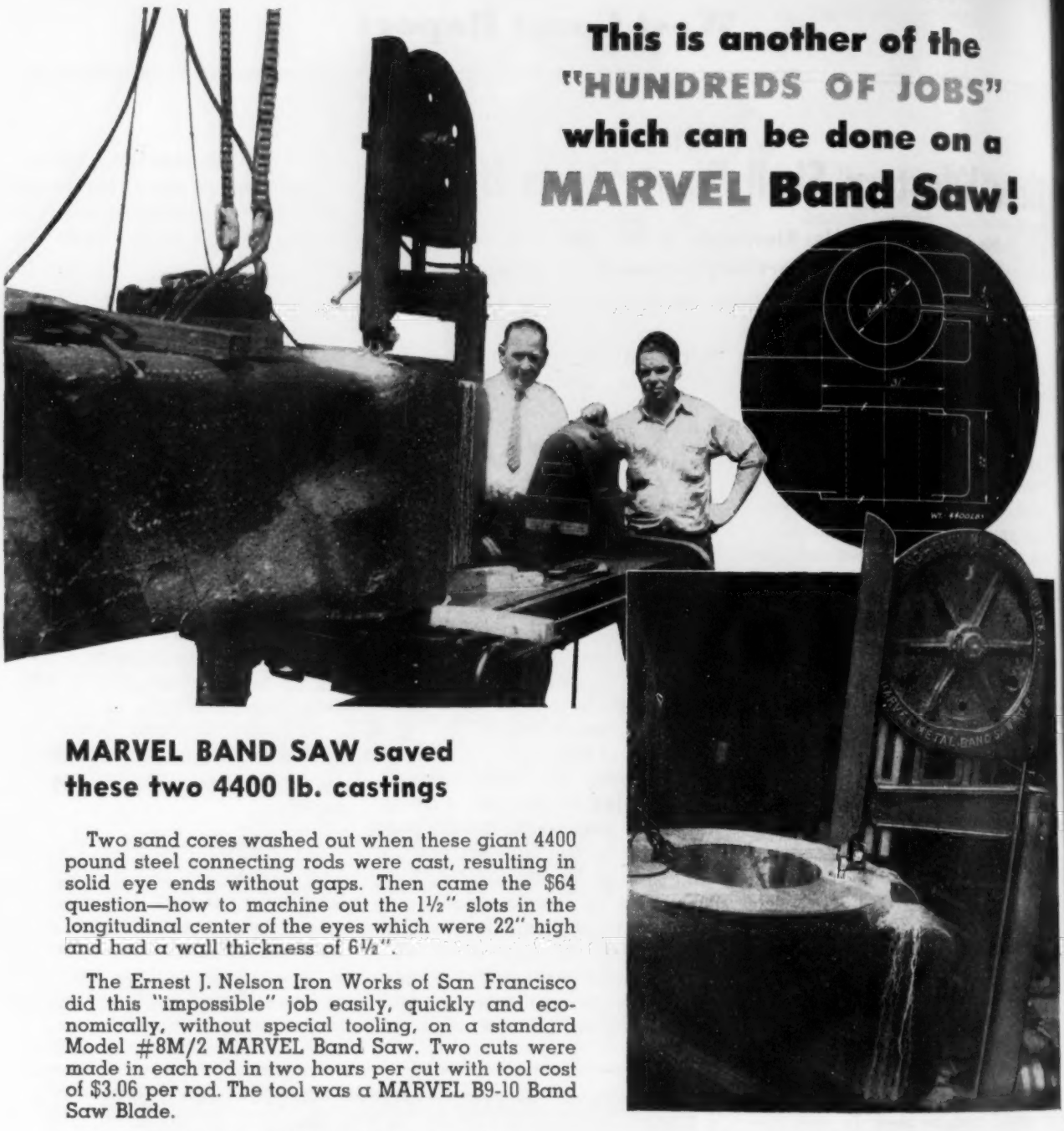
Jet Airliner—Douglas Aircraft of Santa Monica, Calif., is making its bid for the first U. S. commercial jet-powered transport. First fruit of the $30 million project—a wood mock-up—has been built at Santa Monica and shown to airline engineers.



MINT MATERIALS HANDLING: These slabs—90 pct silver, 10 pct copper—will yield 400,000 dimes after processing at the Denver Mint. Each slab is 12 ft long, 12 in. wide, and ¾ in. thick. Handling tongs, made by Heppenstall Co., Pittsburgh, can handle 12 slabs at a time.

UNIVERSITY OF MICHIGAN LIBRARIES

This is another of the "HUNDREDS OF JOBS" which can be done on a MARVEL Band Saw!



MARVEL BAND SAW saved these two 4400 lb. castings

Two sand cores washed out when these giant 4400 pound steel connecting rods were cast, resulting in solid eye ends without gaps. Then came the $64 question—how to machine out the 1½" slots in the longitudinal center of the eyes which were 22" high and had a wall thickness of 6½".

The Ernest J. Nelson Iron Works of San Francisco did this "impossible" job easily, quickly and economically, without special tooling, on a standard Model #8M/2 MARVEL Band Saw. Two cuts were made in each rod in two hours per cut with tool cost of $3.06 per rod. The tool was a MARVEL B9-10 Band Saw Blade.

Every tool room, machine shop and maintenance department needs a MARVEL Series 8 Universal Band Saw—not only for innumerable everyday jobs but for the occasional "trick" operations, where its utmost versatility will save many headaches and dollars.

WRITE FOR CATALOG

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Better Machines-Better Blades

These exclusive MARVEL Features made this job easy!

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SEND FOR CATALOG in SWEET'S FILE

New Shipment Record In The Making

Machine tool shipments during '51 double previous year's total . . . Current rate is even higher . . . Tool steel producers complaining . . . Wanted bigger price boost—*By E. C. Beaudet.*

Bureau of Census figures recently released show that Ohio retained its machine tool leadership during 1951. Ohio builders shipped approximately $192 million worth of machine tools, 30 pct of the national total. The state's output was more than the total production in all of New England ($177.4 million).

Nationwide shipments came to $630 million, more than double 1950's total of $303 million. Shipments this year continued to climb and, as expected, are certain to exceed the 1951 level. So far, shipments this year are running around $610 million. New orders booked in 1952 approximate $677 million.

Boring Machines—Topping the list in 1951 were lathes valued at $170 million. Next came grinding and polishing machines, $121 million, and boring machines, $75 million. A whopping 155 pct increase was responsible for boring machines reaching the third place position held in 1950 by milling machines. Of the total value of boring machines 27 pct was attributed to shipments of 1035 precision boring machines. Milling machines gained 93 pct with a total of $70.3 million.

As in 1950, more than 85 pct of the total value of machine tools shipped was manufactured in New England and North Eastern Central States. Ohio together with Indiana, Illinois, Michigan and Wisconsin accounted for 58 pct of the country's total.

Price Squawk—Tool steel producers are not too enthusiastic about the 4.7 pct ceiling increase allowed under the new amendment to the Office of Price Stabilization pricing regulation. Industry members say an increase of 5.3 pct would be more in line with increases in labor costs and the higher average selling prices commanded by tool steels.

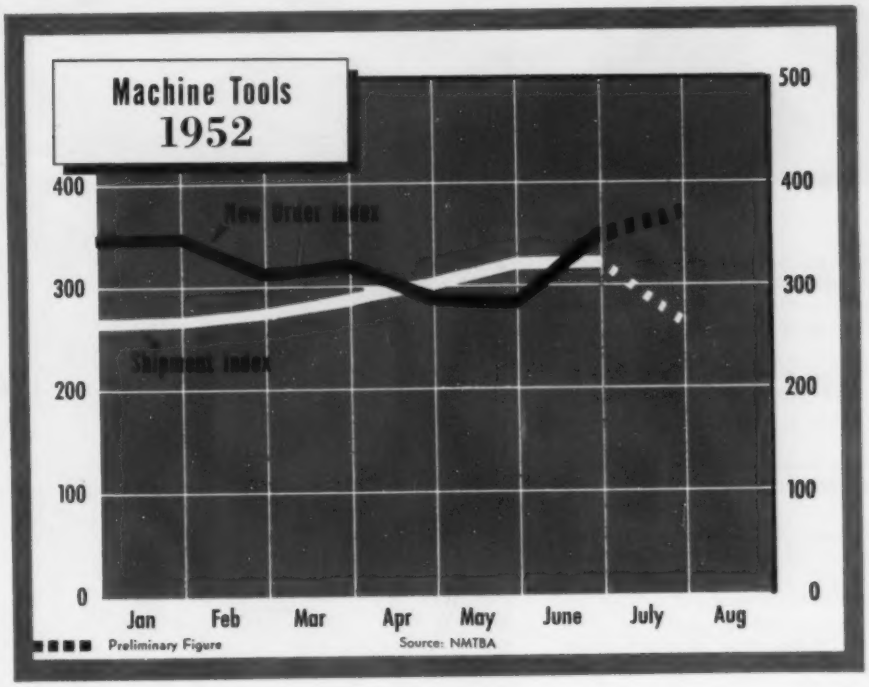
However, OPS remained firm in restricting the price boost to 4.7 pct which they claim is "proportionate" to the average price rise of $5.20 per ton of carbon steel.

Industry contends that price hikes among carbon and certain standard alloy steels covered an increase of 26¢ per hr in manhour production costs. Applying the same 26¢ figure to their own manhour production costs, tool steel producers came up with the 5.3 pct figure.

OPS officials countered this by claiming it was a "misconception" of the technique proposed for carrying out the Office of Defense Mobilization directive.

Slowdown—Full impact of vacation schedules together with slowing affects of the steel strike is believed to have taken its full toll during the month of July.

Preliminary figures released last week by the National Machine Tool Builders' Assn. show the index of shipments dropped 76.2 points from the previous month.



Backlogs Rise — For the first time this year, overall industry back-log turned slightly upward, although still remaining just a bit below 13 months.

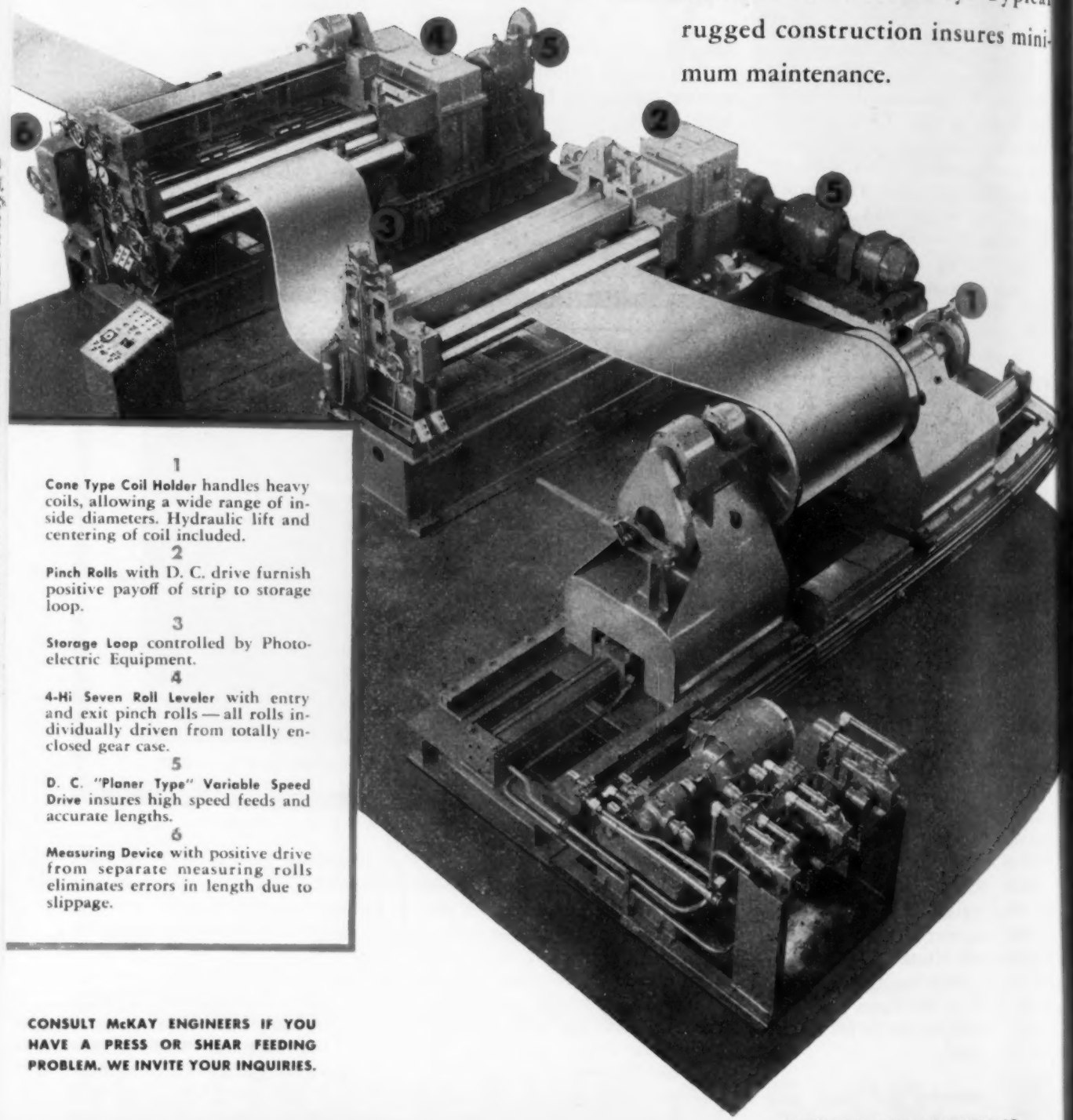
New orders continued to climb during July following the rise in new machine tool orders in June. Since the low point of new orders for the year in May, the new order index has climbed from 284.6 to a preliminary figure of 376.4 for July.

McKAY

PRESS FEED AND CUT-UP LINE

A New Answer to
COIL FEEDING *Problems*

Incorporating the latest in D.C. drive and control, McKay's *new* feeding line provides high production with extreme accuracy. Typical rugged construction insures minimum maintenance.



1
Cone Type Coil Holder handles heavy coils, allowing a wide range of inside diameters. Hydraulic lift and centering of coil included.

2
Pinch Rolls with D. C. drive furnish positive payoff of strip to storage loop.

3
Storage Loop controlled by Photoelectric Equipment.

4
4-Hi Seven Roll Leveler with entry and exit pinch rolls — all rolls individually driven from totally enclosed gear case.

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D. C. "Planer Type" Variable Speed Drive insures high speed feeds and accurate lengths.

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Measuring Device with positive drive from separate measuring rolls eliminates errors in length due to slippage.

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Will a New Boom Sweep Newfoundland?

Government pushing development of province's natural resources . . . Shows signs of becoming a leader in metal and mineral production . . . Britain approached—By *F. Sanderson.*

Newfoundland, Canada's youngest province, is showing signs of becoming a leader in metal and mineral production. It is already known for its iron ore deposits in Labrador and Wabana. There are also important deposits of copper and other base metals as well as the largest fluorspar deposit yet found in Canada.

Premier Joseph Smallwood, a leader in bringing Newfoundland into the Dominion, is now pushing development of his province's natural resources. He is particularly anxious to interest British industry, if not in Newfoundland proper, in the Labrador section.

Playing Them Off—On a recent trip to England he pointed out the need for a development company in the area. He warned that if Britain doesn't do the job, the U.S. will, citing American development of the area's iron ore deposits as a case in point.

Mr. Smallwood said his government would make a $100 million concession to any British industry interested in entering the region. He estimated that development of Labrador would take capital of $500 million to $1 billion.

Ore Lease—Steel Co. of Canada is said to be considering leasing a large iron ore property in the the Sudbury section of Ontario. A special meeting of stockholders in Central Sudbury Lead-Zinc Mines, Ltd., was called this week to consider leasing holdings in the district for 99 years. Property is located about 105 miles northwest of Sudbury.

Stelco's proposal was made by Charles C. Huston, mining engineer. Neither he nor Central Sudbury officials would comment on the deal before the meeting, but THE IRON AGE learned that a lease-royalty deal is being considered for a body of magnetite iron ore said to be on the property.

In the past few years Central Sudbury has been mainly interested in the lead and zinc possibilities of its properties. But early this year a survey showed some 50,000 tons of 2.04 lead and 4.02 zinc occurring in an iron band said to extend 5 miles east and west across the property.

•

Expansion Program — Consolidated Mining & Smelting Co., is pushing work on its $12 million revision program. First unit of the sinter building is expected to go into operation at Trail, B.C., late this year. The entire unit, which is considered the second of the revision program, will be operating in 1953. Program was started 2 years ago and is part of the company's big expansion project involving mines development in addition to power development and expansion of metallurgical plants.

"Those direct mail boys go too far."

Over half the steel has been erected for the 300 x 150 ft. sinter building, which will be 80 ft high. It will house three large 10 x 60-ft sintering machines, which will replace the 14 smaller machines being used at present. Special feed preparation equipment, driers and mixers will be installed to prepare the charge for the sintering process.

Priorities Eased—Smoother and more effective interchangeability of priorities regulations between the United States and Canada is promised in the amended National Production Authority Reg. 3, which became effective last week. Reg. 3 is the basic regulation governing interchange of the controls systems in the 2 countries.

The revised regulation effects these changes:

1. Sec. 3 is deleted, because Canadians are no longer required to obtain government approval before exercising priorities ratings issued by the U. S.

2. A new Sec. 3 is added, providing that persons in the U. S. may apply for government assistance in obtaining Canadian materials. Actually, this has been the practice, but no formal provision has been made for the practice.

3. Sec. 4 is broadened to permit Canadians to apply for allocations or special directions as well as other types of priorities assistance.

4. Sec. 6 (b) and Sec. 7 have been terminated.

Output—Production of steel ingots and castings in June amounted to 305,455 net tons, 94.4 pct of capacity. This compares with 330,524 tons or 98.8 pct for May and 293,515 tons or 90.7 pct for June, 1951.

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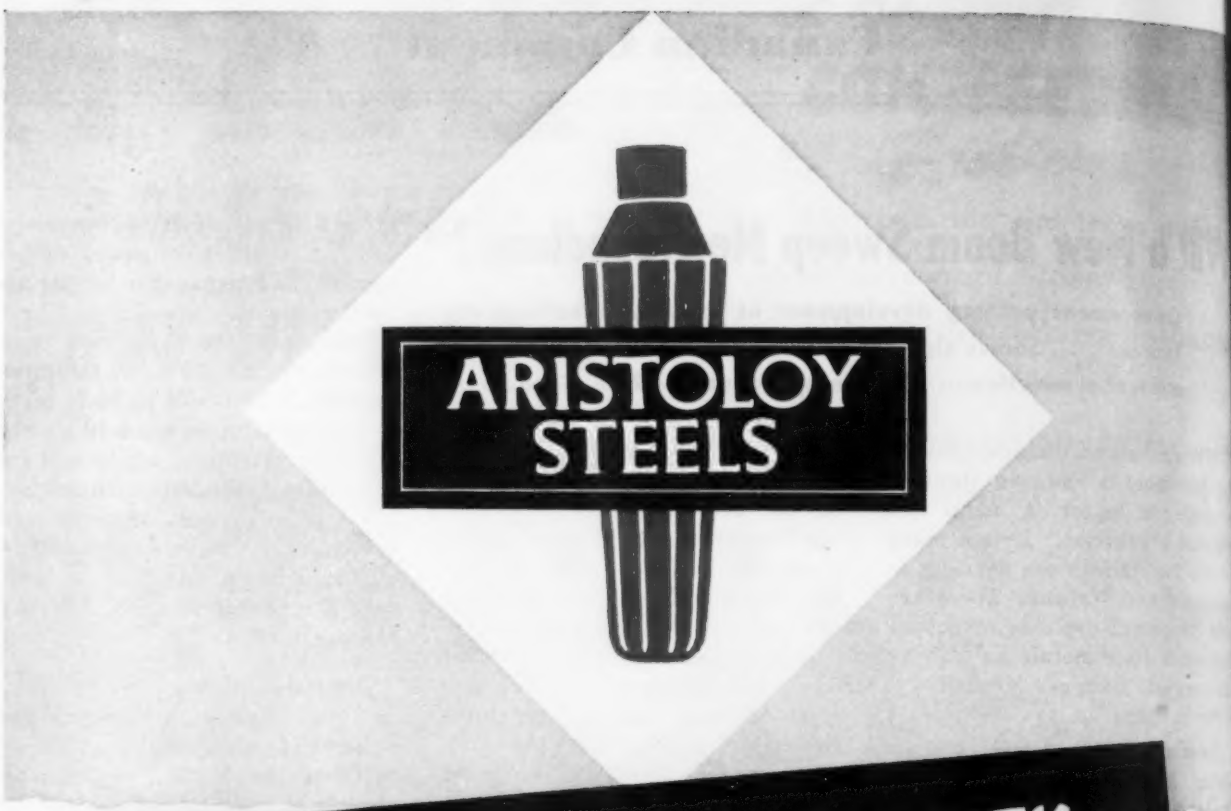

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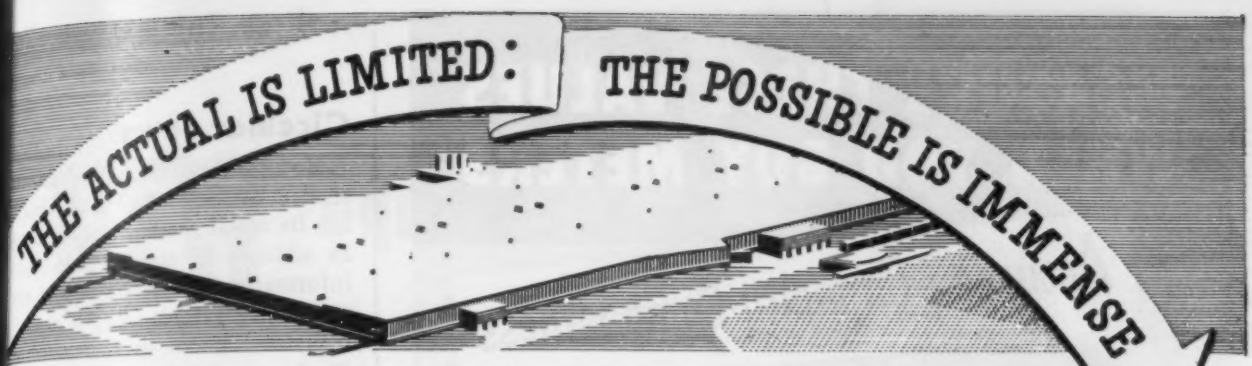

NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

© LE Co. 1952

WELDED DESIGN INCREASES RIGIDITY WITHOUT INCREASING COST

By **Eric Hartmann,** Experimental Research Engineer
The Porter Cable Machine Co., Syracuse, New York

BY changing over the design of our belt platen support to welded steel construction, we have cut deflection over 90%. The former cast construction, (Fig. 1) would deflect from .017" to .020" under 400 pound table pressure. The present welded steel design deflects only .0015" to .002"... 10% of its original value.

Since steel is 2½ times more rigid than gray iron, it was possible to develop a more efficient product design on the platen itself without changing the basic dimensions of the machine or without increasing costs. On machine tools like ours, rigidity is basically important as it directly affects ultimate accuracy and efficient operation of the equipment.

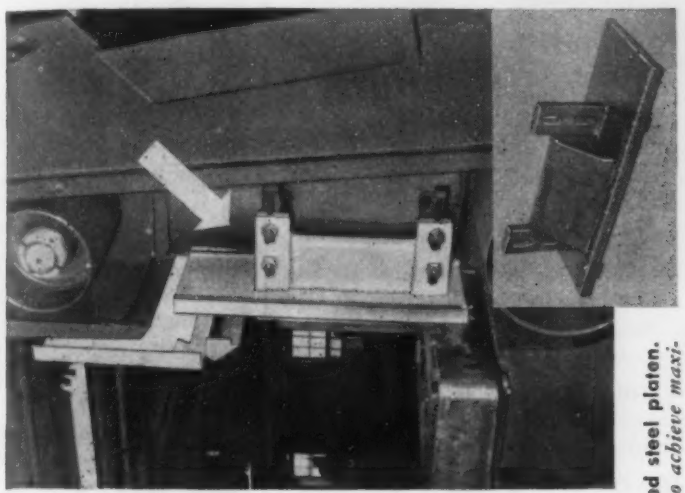

Fig. 3—Detail of Column *on Porter Cable BG-8 Grinder. Shows assembly of belt platen support governing the ultimate accuracy and efficiency of the machine.*

Inset: Rear view of welded steel platen. *Shows efficient use of steel to achieve maximum strength and rigidity per pound of metal.*

WELDED DESIGN ALWAYS SAVES STEEL AND LOWERS COST

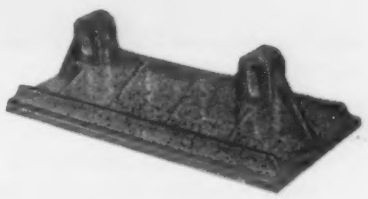

Fig. 1—Former Design—*Belt platen support for grinder was originally a casting. Required machining operations to finish the front face and the mounting arms.*

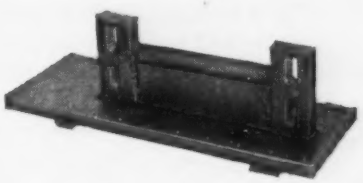

Fig. 2—Present Design in Welded Steel—*Is simpler to fabricate than the original construction. Components are pre-machined prior to welded assembly to simplify manufacture.*

HERE'S HOW

Machine Design Sheets free on request. Designers and Engineers write on your letterhead to Dept. 510

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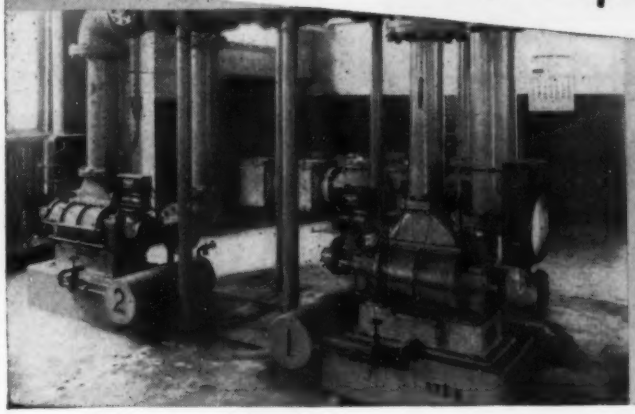
Accuracy·Capacity·Compactness



Part of an installation of nine R-C Positive Displacement Meters in large chemical plant. Capacities from 3,000 cfh to 130,000 cfh.

Industrial buyers rate R-C Positive Displacement Meters "tops" in these basic essentials.

Accuracy—Not affected by pressure, wide variations in loads or other variables. Simple design, with no vanes, valves or small parts, results in maintained accuracy over long years of operation.

Capacity—from 4,000 cfh to 1,000,000 cfh in one unit, to meet practically any industrial metering requirements. Ample ability to absorb overloads.

Compactness—foot for foot of capacity, R-C Meters are the smallest made for industrial use. Can be "tucked away" in relatively small space without loss of valuable production area.

These values have long been proved by large and small industrial plants and public utilities. More R-C Meters are used by gas producing plants, for their own manufacturing and for commercial customers, than any other make. For details on sizes and construction, ask for Bulletin 40-B-14.

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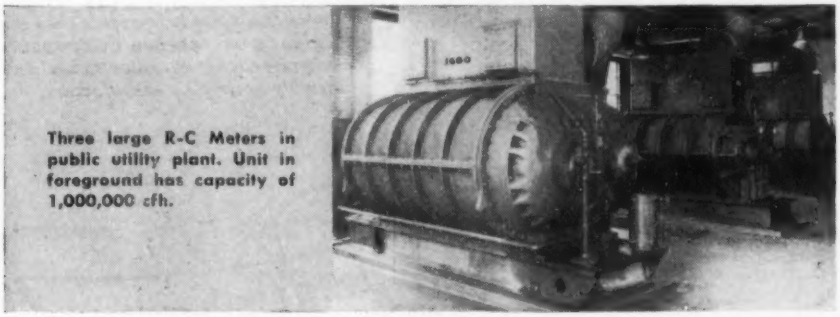


Three large R-C Meters in public utility plant. Unit in foreground has capacity of 1,000,000 cfh.

REG. U.S. PAT. OFF.
ROOTS-CONNERSVILLE BLOWER
A DIVISION OF DRESSER INDUSTRIES, INC.

—Free Publications—

Continued

Circular saws

Motch & Merryweather has issued a series of bulletins describing its metal cutting circular saws. In addition to specification tables, information on operation and construction features of the saws is included. *Motch & Merryweather Machinery Co.*

For free copy circle No. 13 on postcard p. 69

Sheaves

Long cable life depends on proper relationship between cable and sheave. Farrell-Cheek Steel Co. has engineered its sheaves with that particular factor in mind. As a result, the sheaves are capable of withstanding severe service and protect the cable at the same time. Described in a new folder, the sheaves come in sizes and designs to meet most applications, however, the company offers to make special sheaves to meet individual needs. *Farrell-Cheek Steel Co.*

For free copy circle No. 14 on postcard p. 69

Air valves

Amazing versatility of Valvair control valves described in a new pamphlet, results from use of three basic body designs with cylindrical ends identical in size to permit any one of the nine different control assemblies to be inserted on the same model. Another advantage of this standardization is that when changes occur in machine operation or operating conditions it it is not necessary to buy a new valve. *Valvair Corp.*

For free copy circle No. 15 on postcard p. 69

Steel tubing

Technical information of value to engineers and designers associated with the fabrication of equipment for operation at high temperatures and pressures is presented in a new data card published by Babcock & Wilcox Co. The bulletin offers condensed data on mechanical and physical properties, upsetting, swaging, flanging, expanding, bending, and welding of seamless and welded steel tubing. *Babcock & Wilcox Co.*

For free copy circle No. 16 on postcard p. 69

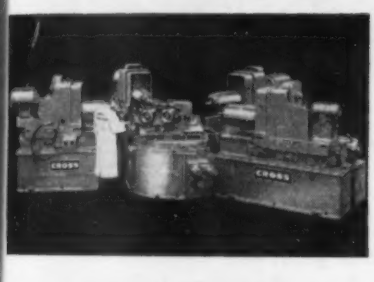
NEW equipment

New and improved production ideas equipment, services and methods described here offer production economies... fill in and mail postcard on page 69 or 70.

Electric-air tapping and drilling machine

Designed for use with multiple or single spindle heads and with provision for interchangeable work holders, a new electric-air-controlled tapping and drilling machine can handle a wide range of drilling and tapping requirements at high production rates. A feature is an electrically controlled four-way air valve with a built-in up and down speed control. Built-in oil pump offers sufficient oil supply at all times. No. 74 machine can be run on a continuous automatic cycle or single stroke operation controlled by foot or hand. Indexing fixtures or work holders, and multiple heads can be designed to handle a large variety of parts. Single spindle tapping attachments take taps to ¾ in. *Ettco Tool Co.*

For more data circle No. 17 on postcard, p. 69



Finishing tank suspension support housings

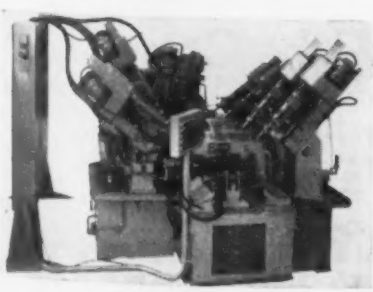
Six tank suspension support housings made of cast armor material having 42 Rc hardness are finished every hour on a new special machine tool. Operations include rough and semi-finish boring a multi-diameter hole and forming two snap ring grooves. The machine has a fluid motor operated index table with five stations: one loading, three boring and one grooving. A 40 hp motor is used for each boring spindle. *Cross Co.*

For more data circle No. 18 on postcard, p. 69

Horn router is aid to greater defense production

Indispensable to many types of trim routing operations in nonferrous metals requiring unusually great swing clearance, the new Ecco horn router can be equipped with 3, 5, or 7½ hp, 3600 rpm drive motor. Spindle speeds of 10,000 or 20,000 rpm are easily and quickly obtained by means of a two-step drive pulley arrangement. An adjustable three-position positive depth stop has been built-in for precision step-routing, while the minimum clearance between the collet chuck and the horn measures 10 in. An air-operated coolant spray attachment is optional equipment. One standard pilot bracket and guide is furnished with the machine. Others can be designed and supplied to special order. *Ekstrom, Carlson & Co.*

For more data circle No. 19 on postcard, p. 69



Machine drills holes in tractor crankshafts

New transfer crankshaft drilling machine has been designed and built to drill lubrication holes in tractor crankshafts. The machine employs all Avey units including Torquematic control in order to eliminate drill breakage. Transfer of the crankshaft through the machine is automatic through hydraulic indexing. Production on the machine is rated at 60 crankshafts per hour. *Avey Drilling Machine Co.*

For more data circle No. 20 on postcard, p. 69

Turn Page

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"It's foolish to try to be bigger than you are"

REMEMBER Aesop's fable of the frog and the ox? Told 2,500 years ago, it goes:

"Three young frogs cried to their mother that a little brother had been trampled by the largest beast in the swamp. 'Oh, no,' said the mother, 'no beast is larger than I.' And she blew herself up to show how big she really was. 'But it was much bigger,' the little ones chorused. Whereupon the vain mother inflated herself until she burst." And the moral was, "It's foolish to try to be bigger than you are."

Aside from the wisdom of the fable for each of us individually, there is solemn warning for us as a nation. Some among us seem to believe that with an unlimited supply of taxpayers' dollars America can buy anything--ease and security at home, acceptance of our ideas abroad, friendship of other peoples, even world peace.

Like the vain frog, America inflates herself more and more dangerously, trying to stretch herself to be the biggest thing in the swamp. Meanwhile the enormous beast that is the world goes its own way, scarcely affected by the vainglorious display of America's inflation. It's the same old world that was indifferent before the pomp of Egypt, Persia, Greece and Rome.

How will our present "puffing" end? Isn't it obvious that continued inflation can bring disaster? Only by a realistic policy of living within our means--not trying to be bigger than we are--can America avoid the catastrophe of Aesop's foolish frog.

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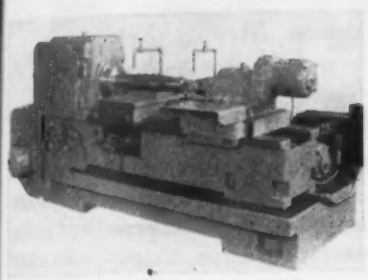
RAILROAD TRACK SPIKES - CONDUIT - HOT AND COLD FINISHED CARBON AND ALLOY BARS - PIPE AND TUBULAR PRODUCTS - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - RODS - SHEETS - PLATES.

External thread rolling on hollow work

Nineteen thousand, four hundred forty pieces per hour is reported the rate at which external, class 3 fit threads are rolled in ½ in.-13 hollow set screws of SAE 1035 steel on the new Model 300 Prutton Rollmaster. The machine is said to perform comparably on either hollow or solid work in a variety of metals ranging from nonferrous, through aluminum. magnesium, to hardened and stainless steels. The Prutton planetary die principle used reduces thread rolling pressure by distributing it evenly over a full 30 in. of die length, eliminating danger of crushing hollow parts due to excessive pressure from shorter dies. Pieces are hopper fed, and roll at close intervals around the circumstances of the die. *D. H. Prutton Machinery Co.*

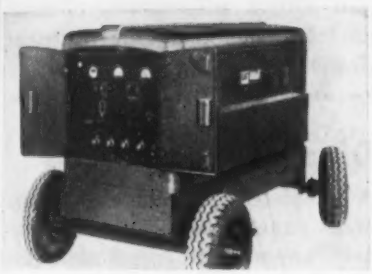
For more data circle No. 21 on postcard, p. 69



Turning lathes produce 75-mm to 8-in. shells

A redesigned line of shell turning lathes for the manufacture of artillery shells from 75 mm through 8 in. has been announced. Lathes for centering, rough turning, nose boring, finish turning, band grooving, base facing, and band turning are available. The Williams Brantford lathes feature heavy bed and headstock construction; spindle driven through worm and worm wheel gearing; hydraulic automatic feed cycle. *Williams Tool Corp.*

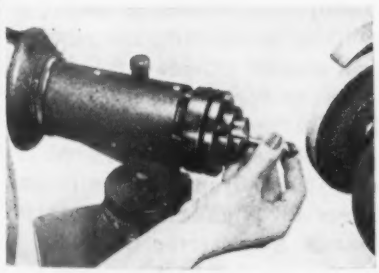
For more data circle No. 22 on postcard, p. 69



Portable motor generator frequency changer

Now available is a new 30 kw motor generator frequency changer for aircraft applications in testing instruments, functional testing of radio and radar systems, fire control systems, servos, or any test operation where regulated 400 cycle power is required. Mounted on a solid steel base, a 50 hp motor drives the 28 pole 400 cycle generator by means of pulleys and belts at 1714 rpm, insuring exactly 400 cycle output. *Motor Generator Corp.*

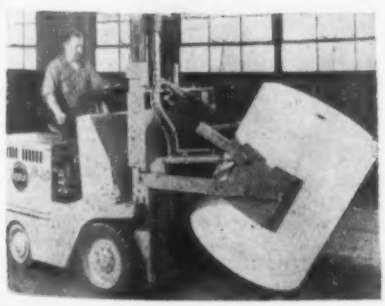
For more data circle No. 23 on postcard, p. 69



Fixture speeds cutter grinding operations

New relief grinder is said to speed up grinding operations as much as 300 pct. Main housing is cast iron which supports a hardened and ground spindle on two large bearing surfaces. Fixture swings 90° to the right or left; base is calibrated in 5° increments. The device handles work from 1/16 to 1 in. diam with standard collets. Adjustment pins are provided for 1, 2, 3, 4 and 6 fluted cutter grinding. *Industrial Grinding Co.*

For more data circle No. 24 on postcard, p. 69



Roll clamp stacks horizontally, vertically

A quickly detachable roll clamp attachment for fork trucks picks up and stacks cylindrical objects horizontally or vertically. The clamp allows truck operators to pick up and haul paper rolls, drums, large pipe or any other cylindrical material from 1½ to 3 ft diam. It rotates 90° in a vertical plane so loads may be stacked vertically or horizontally. Clamping pressure is controlled by an adjustable relief valve in the hydraulic system. Installed on Baker's four purpose carriage, the clamp detached in 2 min. *Baker-Raulang Co.*

For more data circle No. 25 on postcard, p. 69

Turn Page

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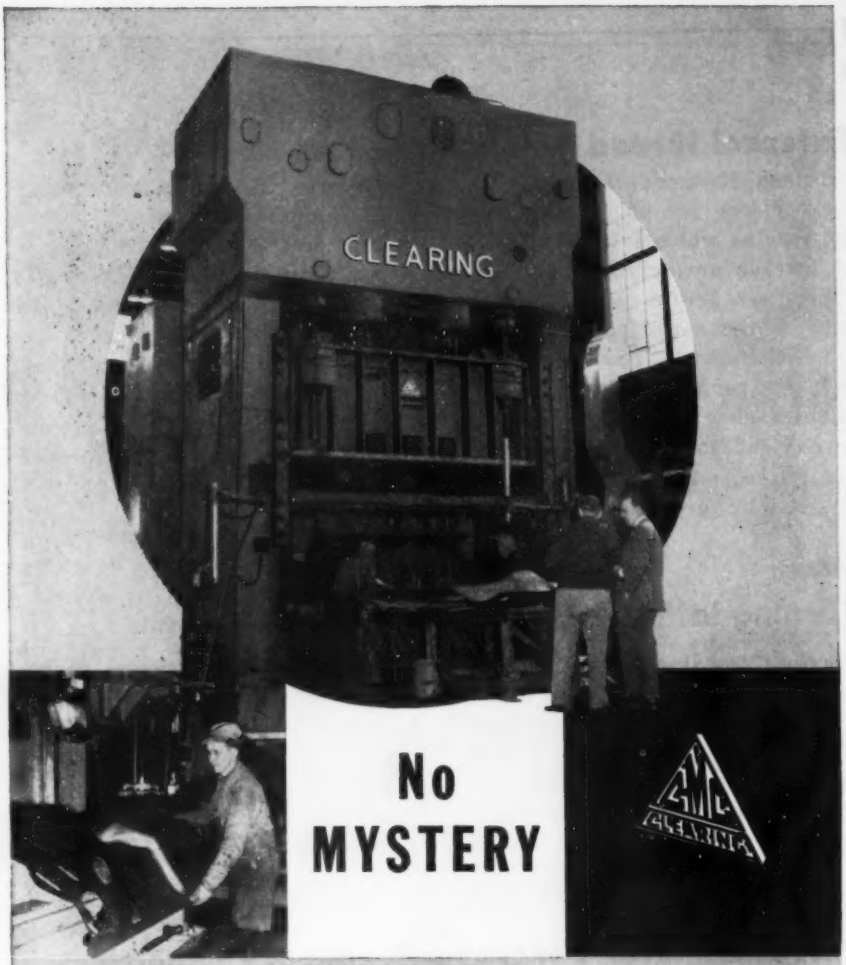

Clearing presses are much in evidence in the Kaiser-Frazer Shadywillow plant, opened some months ago in the Wheeling area. The one in the photo is part of a line of four Clearings forming a production group in the new plant.

Kaiser-Frazer knew exactly what they were doing when they chose these Clearing presses. You see, there are Clearing presses in the parent plant at Willow Run, and they've been on the job there for quite a while.

CLEARING MACHINE CORPORATION

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HAMILTON DIVISION, HAMILTON, OHIO

CLEARING PRESSES

THE WAY TO EFFICIENT MASS PRODUCTION

—New Equipment—

Continued

Small gaging head

New type gaging head known as the Plunjet has been developed for use in conjunction with the Precisionaire and other air gages for gaging wide tolerance work. Gaging head is calibrated by a feeler gage having minimum and maximum limit elements. Two types are available, the normal and the reverse, and they may be had in three standard ranges: 0.040, 0.020, 0.010. The Plunjet has many advantages, especially for measuring irregular parts such as the profile of air craft turbine blades and buckets. *Sheffield Corp.*

For more data circle No. 26 on postcard, p. 69

Curtain wall material

Seaporclad, a new curtain wall material, is a lamination of porcelain enameled steel to thermal and noise insulating cores. Single piece sizes measure up to 4 x 10 ft. Can be furnished in any color or texture and with a wide variety of metal surfaces and insulating materials. *Seaporcel Metals, Inc.*

For more data circle No. 27 on postcard, p. 69

Dispensing pumps

A complete line of air-motor operated pumps and accessories has been announced for automatic application of heavy to light materials, such as sealers, adhesives, roofing, waterproofing, insulating, caulking compounds. Eleven standard models provide complete systems for spray gun, pole gun and Flo-gun applications. Models are available for use with original 400 and 100-lb drums, and with container for 5 gal material package. *Lincoln Engineering Co.*

For more data circle No. 28 on postcard, p. 69

Abrasive belt dresser

Faster stock removal, longer belt life, and up to 75 pct increase in total stock removal during belt life, are results claimed for a new abrasive belt dresser. When contacting abrasive belts in motion, the Beltbrasive dresser cutters remove glazing and loading from the belt and expose more particles for more effective grinding, sanding or polishing results. *Desmond-Stephan Mfg. Co.*

For more data circle No. 29 on postcard, p. 69

Etchant for aluminum

Among the advantages claimed for a new etchant for aluminum are the following: It etches rapidly, giving a controlled etch of any depth desired while imparting a velvety finish to the surface; eliminates hard scale build-up on tanks and heating coils; provides uniform etching without excessive foaming or fuming. Working solutions of Compound No. 60 run 2, 3 and 4 weeks before dumping is necessary. Parts rinse readily in cold or hot water. *Oakite Products, Inc.*

For more data circle No. 30 on postcard, p. 69

Circular saws

A complete line of standard type and on-the-job engineered and precision fabricated tungsten carbide tipped circular saws are manufactured in sizes 6 to 36 in. diam. They cut all wood, fiber boards, hardboards, laminates, plastics and highly abrasive materials. Also will cut nails, wire and similar obstructions. *Rockwell Mfg. Co.*

For more data circle No. 31 on postcard, p. 69

Turn to Page 82

If you buy Cutting Tools

Are you responsible for purchase or specification of cutting tools —or wear and abrasion-resistant parts? You'll find the *Gorham* Tool Catalog a *helpful time saver!* 120 pages, packed with useful information, describe and illustrate the complete *Gorham* line—*PLUS* an informative section of Engineering Data. Request your free copy on company letterhead.

We also offer the service of *Gorham* field engineers, whose counsel in specification and design for special tooling problems is yours for the asking. Their recommendations are backed by *Gorham's* 25-year background in tool design, manufacture and heat treatment. Write for the name of your nearby *Gorham* representative.

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easy on
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the easy
bearing mounting
and removal system
pioneered by SKF

SKF®
BALL AND ROLLER BEARINGS

No designer today has to be sold on the advantages of anti-friction bearings. However they *used* to pose one serious problem to machine designers — that of the difficulty of mounting and removing interference fits, especially in bearings of comparatively large size. *Not so today.*

In the System of Hydraulic Removal, developed by SKF, OIL does the work. With simple equipment, you force oil between the shaft and the bearing, pressure breaks the fit, and the bearing slides off quickly, easily, safe from damage to bearing or housing. The same system eliminates the need for driving the tapered bore bearing *on* the shaft, or heating to obtain a shrink fit.

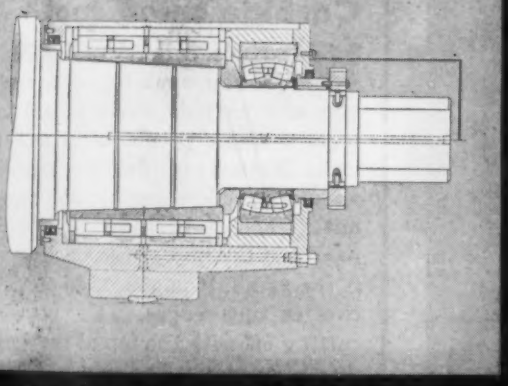
The accompanying illustrations show a few of the successful applications of this SKF principle —on roll neck bearings in steel mills, printing cylinder and paper mill roll bearings, on SKF "OK" Shaft Couplings, main and crank pin bearings in air compressors. The principle is also well suited to other equipment such as crushers, construction machinery, etc.

SKF's first patent application on the hydraulic mounting principle was made in 1943.

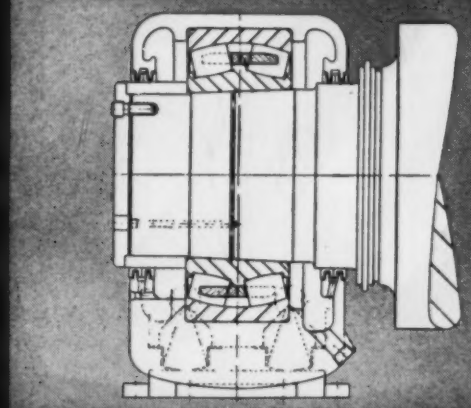
Since then, more and more equipment designers are taking advantage of this SKF "first." For further details, write for SKF Brochure No. 344.

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.
—manufacturers of **SKF** *and* HESS-BRIGHT *bearings.*

7361

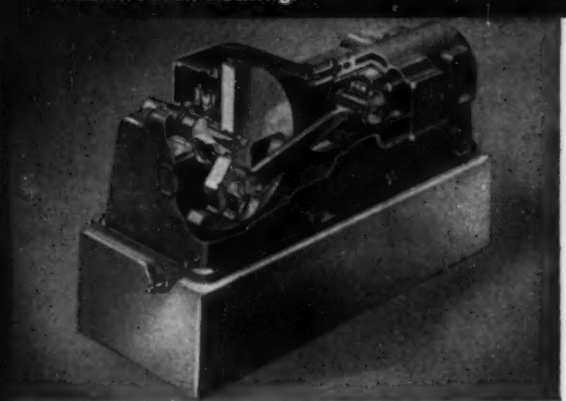


Typical Application Of **SKF** Hydraulic Mounting For Roll Neck Bearing.



Typical Application Of **SKF** Hydraulic Mounting For Printing Cylinder And Paper Machine Roll Bearing.

"OK" Coupling On 7 3/8" Marine Shaft, Depends On Pressure Only To Transmit Torque. Separable By **SKF** Hydraulic System.



SKF Roller Main And Crank Pin Bearings With Hydraulic Mounting Feature On A Pneumatic Compressor.

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Threaded Specialties
to Class 3 Fit

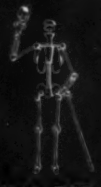
For years Pawtucket has specialized in specialties — of any size, in any metal, to any specifications.

Two items have become widely used because of their lower cost, more accurate fit and greater-than-needed strength. Pawtucket's eye bolts and tee-head bolts are made by an exclusive process that guarantees all these advantages.

For these and any other threaded specialties, save by seeing Pawtucket — "The Bolt Man".

BETTER BOLTS SINCE 1882

"THE BOLT MAN"



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—New Equipment—

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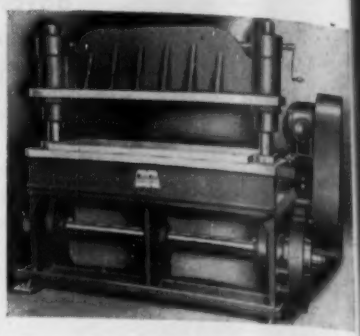


Punch press

A versatile 30-ton punch press has all steel welded construction with an exceptionally large bed and ram area. Among its features are: 80 strokes per min; practically unlimited shut-die height to order; positive brake and counterbalance with exclusive equilabrator; four-point engaging clutch; and electrically operated clutch control. The machine can be converted into power squaring shear. *Diamond Machine Tool Co.*

For more data circle No. 32 on postcard, p. 69

Carbide cutoff tool

Solid carbide cutoff tool for B&S automatic screw machines has steel hub and carbide blade brazed to form a single permanently bonded unit. Method of holding carbide assures complete support and minimizes carbide breakage and parting from the hub. A second feature is the grind. It is gashed to provide two cutting edges. This permits cutting off with the top of the work coming or going. Ten standard sizes are stocked. *Gay-Lee Co.*

For more data circle No. 33 on postcard, p. 69

Air transformer

New HLD air transformer for compressed air lines has a built-in two-stage regulating principle which provides easier adjustment of pressures, requiring only finger tip control of an adjusting knob. Oil and moisture, present in compressed air lines, is eliminated by the transformer which traps the liquids and delivers clean air to all outlets. Transformer has two regulated air outlets and two unregulated. Capacity is 100 cfm. *DeVilbiss Co.*

For more data circle No. 34 on postcard, p. 69

Deep black finish

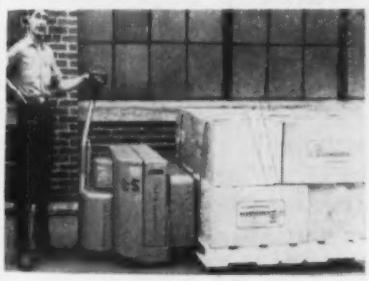
New jet black finish for iron and steel, said to have ten times the corrosion resistance of conventional blacks, is used in water solution at low temperatures. Parts are immersed for 15 to 30 min in the processing bath, then are rinsed and dried. After oiling or waxing, the deep black, durable finish is ready for service. Product is tradenamed Parco Black. *Parker Rust Proof Co.*

For more data circle No. 35 on postcard, p. 69

Heat resisting roll

Heat resisting rolls have been developed with protected bearings for roller conveyers handling articles having high temperatures. The design uses regular conveyer parts but takes the ball bearing out of the roll and puts it in a protected position on the frame, away from damaging heat. With this method of protected bearings, material as hot as 1000°F can be handled. All parts are easily removable. *Logan Co.*

For more data circle No. 36 on postcard, p. 69



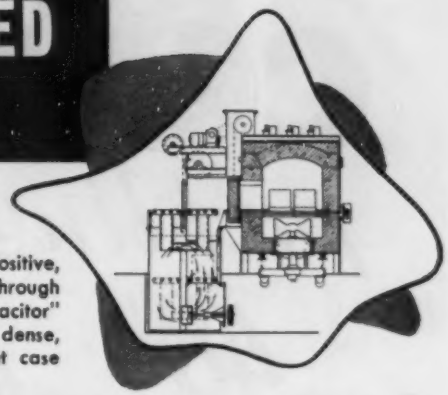
Low lift walkie truck

Increase in power accomplished with a decrease in overall length features the Jacklift Electric low lift walkie truck. Smoother, safer, faster and more controlled handling of loads result from four basic operational advantages: all controls in handle head providing quicker control over any maneuver; electric deadman type brakes; vertical handle operation; and timed acceleration. Capacity of truck is 4000 to 6000 lb. Pallet or platform types are available. Jerk-free starting and cushioned braking also assure smooth operation. *Lewis-Shepard.*

For more data circle No. 37 on postcard, p. 69

Turn Page

UNSURPASSED QUALITY



Combines the operating economies of large continuous furnaces with the flexibility of batch-type equipment. Positive, directed flow of furnace atmosphere through load, combined with the "heat capacitor" assures rapid, uniform heating on dense, bulk-loaded parts and even on light case work.

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The Dow Furnace has established production records in plants throughout the country. Forced, uniform quenching from atmosphere gives full hardness, reduces distortion, eliminates decarburization. One man can operate *two* furnaces with ease, producing as much as 1500-lbs. of light case work per hour.

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Whether it's gas cyaniding, gas carburizing, clean hardening or carbon restoration work, the Dow Furnace is capable of processing a variety of parts having a wide range of heat treatments. To demonstrate the close tolerances of heat treatments, send us samples of your own parts for processing.

AT LOWER COSTS

Reductions in direct labor, material handling, machining and cleaning costs, coupled with improved quality, have resulted in savings amortizing the original cost of the Dow Furnace in a few months. Gas cyanides for ¼ to ⅓ the cost of liquid cyaniding.

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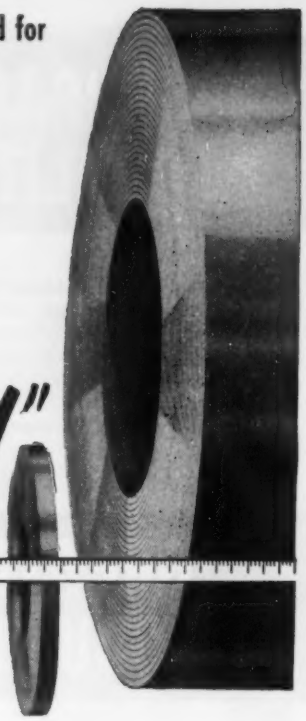
COIL pickling

From 48" down to 1"



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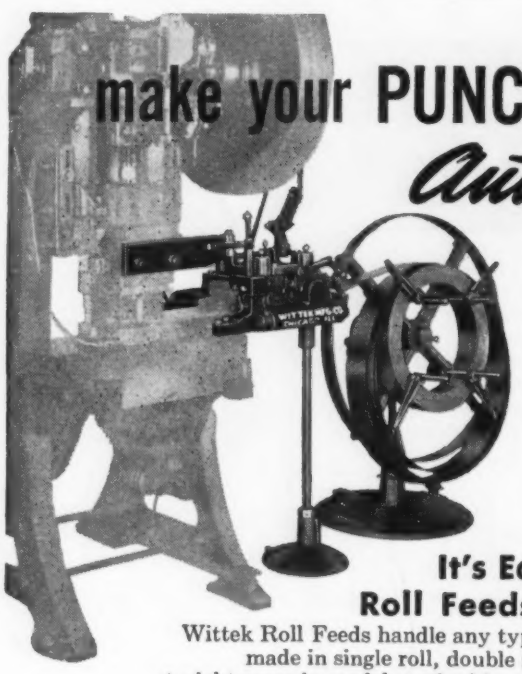
make your PUNCH PRESSES *Automatic*



It's Easy...with WITTEK Roll Feeds and Reel Stands

Wittek Roll Feeds handle any type of coiled strip stock and are made in single roll, double roll, and compound types with straighteners, in models to feed in any of four directions. They are reliable and accurate with simple, quick adjustment of feed length. Standard sizes and models meet a wide variety of press size and capacity conditions.

Wittek Reel Stands facilitate handling coiled stock.

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WITTEK Manufacturing Co.

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Automatic ROLL FEEDS AND REEL STANDS WMCo

—New Equipment—

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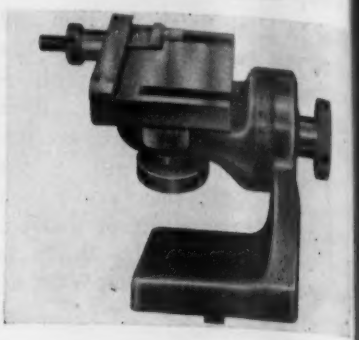

Grinding fixture

New attachment for grinding Landis tangential chasers, is used to grind the compound rake and lead angles. The chaser platen can be adjusted vertically making possible the grinding of any desired rake angle. Platen rotates 360° horizontally providing accurate means of producing the desired lead angle. Fixture can be adapted for use on any grinding machine which has a traversing table regardless of type grinding wheel used. *Landis Machine Co.*

For more data circle No. 38 on postcard, p. 6

Diamond dust salvage

Salvaging industrial diamonds lost in the wearing away of diamond-impregnated grinding wheels and diamond-tipped tools is now possible with a new Torit dust collector. Where a diamond wheel is permanently installed as part of a grinding machine, the unit can be installed to serve only that machine. To collect diamond dusts from machines where diamond wheels are used only intermittently, Torit has developed mobile units mounted on casters. With the collectors there is no danger of dust being lost for the filters are constructed of extra hard surface and tightly woven material. No particles can become enmeshed. *Torit Mfg. Co.*

For more data circle No. 39 on postcard, p. 6

Heavy duty bearing

New large size linear ball bearing is available for use on 2½ in. diam shafts. It is suitable for heavy load applications or where extreme rigidity requirements dictate the use of heavy supporting shafts. *Thomson Industries, Inc.*

For more data circle No. 40 on postcard, p. 6

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Table-rack combination

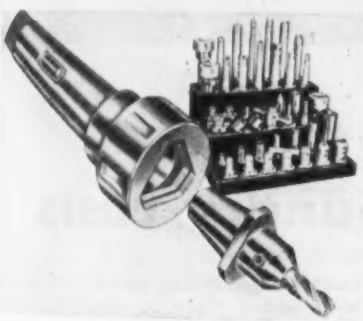
A new pair of combination work tables and tool racks, and auxiliary cabinet and tool rack, have been announced as optional equipment with the Wales sheet metal fabricator. Table-rack combination provides additional work and storage area for more efficient operation. Cabinet and rack provide drawers and shelves. The sheet metal fabricator punches and notches up to ¼ in. thick mild steel from blueprints or operation sheets; no templates required. *Wales-Strippit Corp.*

For more data circle No. 41 on postcard, p. 69

Knee action caster

Users of new knee-action, shock-absorbing casters may expect longer equipment life, faster handling, and lower labor costs because trucks will push much easier. Shimmy is eliminated because wheels are always kept in contact with the floor. Duoflex Caster's knee action has lifetime lubrication. There is only one moving part. Springs are fully enclosed; construction is box type. *All Steel Welded Truck Co.*

For more data circle No. 42 on postcard, p. 69



Quick-change holder

Triple locking feature of a new tool holder permits faster tool changes and assures constant repositioning. Three point holding of the taper shank design eliminates run out on precision work. The 57-piece tool set includes holders for boring, milling, and lathe applications; adapters for shell mills, end mills, drill chucks, and boring heads. *Portage Double-Quick Tool Co.*

For more data circle No. 43 on postcard, p. 69

SHEET METAL FABRICATION

BY

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Contract Manufacturing Facilities

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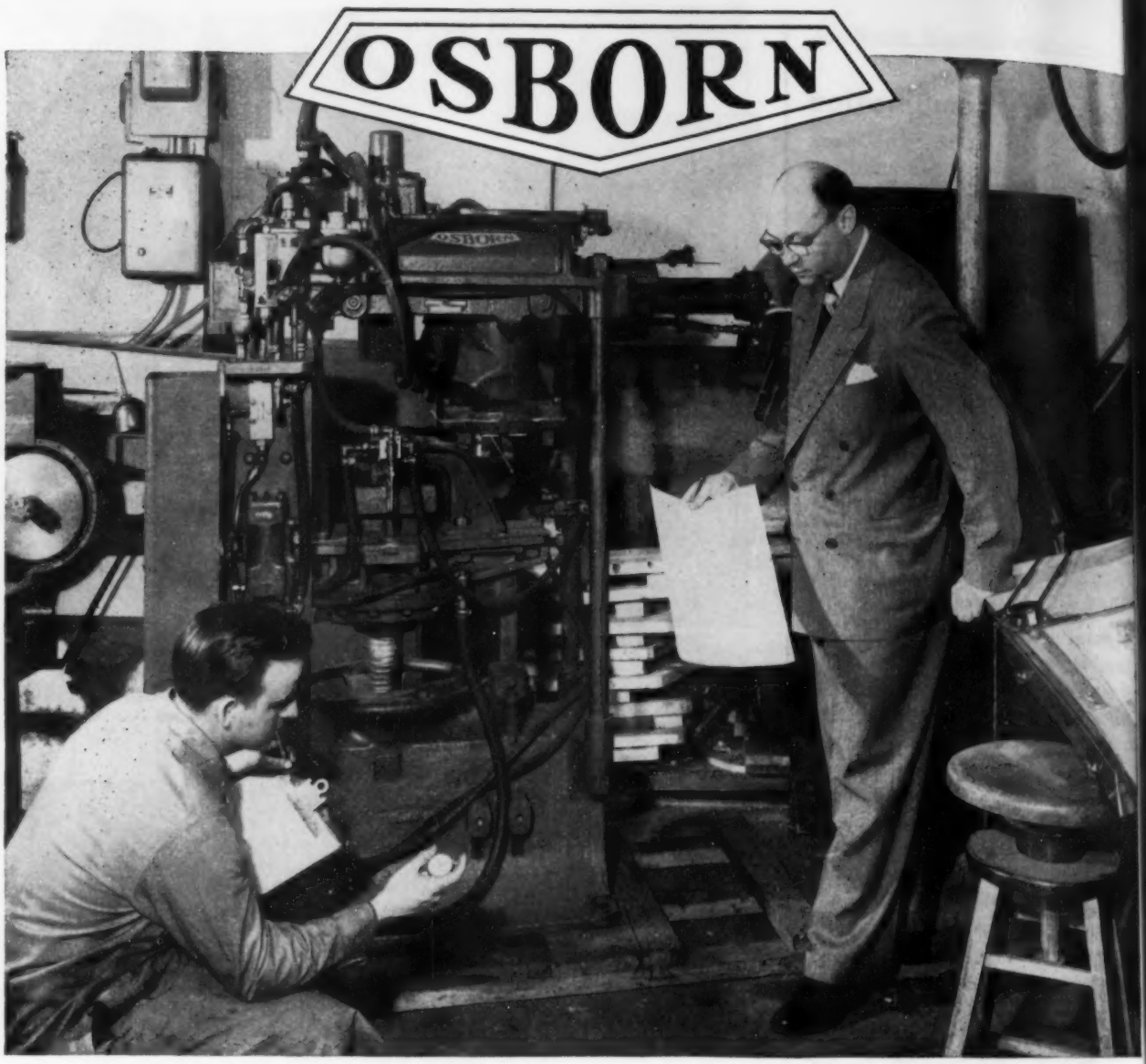

OSBORN research has no substitute when it comes to cutting foundry costs

THESE research men are seeking new cost cutting answers to your foundry molding and core blowing problems. They start by gathering facts in your shop, then test and retest hundreds of time saving ideas in Osborn's own proving grounds before machinery recommendations are made to you. This down-to-earth approach is why you can be confident every time you consult Osborn first on your foundry needs.

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The Iron Age

SALUTES

Hugo B. Lundberg, Sr.

Community service is more than a phrase to this self-made and hardworking Lansing executive.

COMMUNITY service is a term that has real meaning to Hugo B. Lundberg, Sr., voted "Distinguished Citizen of 1952" of Lansing, Mich.

For more than 30 years he has devoted valuable time from his business interests—Michigan Screw Co., later Lundberg Screw Products Co.—to serve his city in official capacities as well as taking part in church work, service organizations, and other community activities.

Hugo is now chairman of the board of Lundberg Screw Products and was recently reelected president of the Board of Water and Electric Light Commissioners of Lansing, one of the largest of its kind in the country. He has served on this board for 32 years.

His biography is a success story of a lad who came to this country from Sweden with his immigrant parents in the 1890's and worked his way up to president of his own company, known for both his business and public work.

He received his technical education in Chicago high schools. In 1906 he went to Lansing where he participated in the organization of the Michigan Screw Co. which he served as superintendent, general manager and president. Lundberg Screw Products was formed in 1933.

Community activities were his major interests outside of his business life. He did Boy Scout work, was president of the YMCA, took part in Community Chest, Rotary Club and church work.

His three sons, George, Hugo, Jr., and Ted are all associated with him in his business activities.

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"X" and "XA

AJAX DUPLEX ROLL

SPECIAL PROCESS ROLL

SPECIAL TUBE MILL ROL

CLIMAX and AJAX ROLL

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The Iron Age

INTRODUCES

Andrew J. Higgins, Jr., elected president, HIGGINS, INC., New Orleans; **Frank O. Higgins,** named vice-president and general manager; **Michael Macheca** elected vice-president and treasurer. and **Lee Calongne** named secretary.

Wallace L. Howe, named vice-president and director, NORTON CO., Worcester, succeeding **Milton F. Beecher,** who is retiring.

Richard S. Shannon, appointed assistant to vice-president in charge of sales, CHRYSLER CORP.

Richard C. Smyth, made director of employee relations, ARMA CORP., subsidiary of American Bosch Corp.

W. Lyle Sturtevant, appointed to electrical conductor staff, Chicago Office, KAISER ALUMINUM & CHEMICAL SALES, INC., Oakland, Calif.

Paul A. Dahlen, appointed application engineer, STEVENS MFG. CO., Mansfield, Ohio.

Charles W. Hammond, appointed head of Mechanical Engineering Dept., WALTER KIDDE NUCLEAR LABORATORIES, New York.

Arvo J. Juhola, named supervisor of special contract research, PITTSBURGH COKE & CHEMICAL CO.

Harry D. George, promoted to superintendent of Production Control, Lukenweld Div., LUKENS STEEL CO., Coatesville, Pa.

Samuel S. Auchincloss, named executive vice-president, DEWALT INC., Lancaster, Pa., subsidiary of American Machine & Foundry Co., of New York.

Walter H. Mickey, appointed treasurer, BARROWS PORCELAIN ENAMEL CO., Cincinnati.

Harvey F. Phipard, Jr., appointed director of research and engineering, CONTINENTAL SCREW CO., New Bedford, Mass.; **Edward J. Locke, Jr.,** appointed chief engineer; and **George E. Jenney, Jr.,** named master mechanic.

Archie M. Naysmith, apponted general superintendent and plant engineer, MACWHYTE CO., Kenosha, Wis.; and **R. B. Whyte, Jr.,** appointed assistant general superintendent and assistant plant engineer.

Hewitt Smith, elected vice-president in charge of operations, WOODWARD IRON CO., Birmingham; **John W. Hager,** named general superintendent of mining operations.

M. C. Nelson, promoted to vice-president and director of BARKSDALE ORGANIZATION.

Don E. Sweeney, named sales manager, of P&H's Diesel Engine Div., Crystal Lake, Ill., HARNISCHFEGER CORP.

Joseph G. Connolly, appointed general counsel and secretary, AUDIO & VIDEO PRODUCTS CORP., New York; and **Kenneth Boothe,** elected a vice-president and director of Instrumentation Div.

Lewis A. Hester, appointed manager, Locomotive Sales, BALDWIN-LIMA-HAMILTON CORP., Eddystone, Pa.

Edward F. Whittemore, appointed purchasing agent, Detroit plant, MORSE CHAIN CO.

C. W. Diven, Jr., appointed assistant sales manager, Philadelphia district, SHARON STEEL CORP.

William C. Ayres, named manager of materials, HOTPOINT CO., Chicago.

M. J. BURRESS, appointed vice-president, Tay Holbrook Inc., San Francisco.

ALBERT B. FRIEDMANN, named assistant to the vice-president—Sales, Chicago Vitreous Enamel Products Co., Cicero, Ill.

ROBERT J. THOMAS, appointed manager, Secondary Products Div., U. S. Steel's Tennessee Coal & Iron Div.

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Personnel

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William P. Sims, appointed branch manager, FRUEHAUF TRAILER CO., Norfolk, Va. branch.

Vean L. Geyer, appointed manager, Yonker's plant, OTIS ELEVATOR CO., succeding Thomas S. Jones, who is retiring. **George McRae,** appointed assistant manager.

Clifford R. Palkie, becomes assistant sales manager, Organic Coatings Div., UNITED CHROMIUM, INC., New York.

Kenneth B. Cohen, appointed sales promotion manager, BUILDERS STRUCTURAL STEEL CORP., Cleveland.

William M. North, promoted to general manager, Kansas Ordnance Plant, NATIONAL GYPSUM CO.; and **Colon Brown,** promoted to general supervisor of four subsidiary companies.

Edward L. Lape, appointed assistant general merchandising manager, United Motors Service Div., GENERAL MOTORS CORP.; and **H. B. Smith,** named assistant general sales manager.

Charles B. Eisenhauer, appointed manager of manufacturing, HOUDAILLE-HERSHEY CORP., Detroit.

Don Faulkner, appointed sales engineer, HYDRO-AIRE, INC., Burbank, Calif.

J. E. Williams, appointed general manager, newly established Ramset Div., OLIN INDUSTRIES, INC.

Wesley G. Hurst, named sales representative, midwest organization, general machinery division, ALLIS-CHALMERS MFG. CO.; **George E. Johnson,** appointed sales representative; and **W. Ellis Rosser,** named sales representative also.

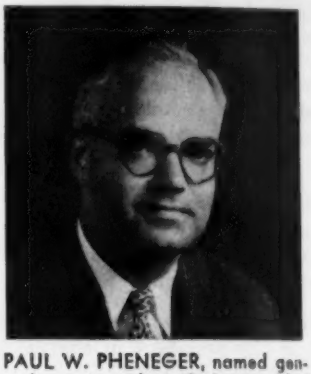
Albert W. McAbee named assistant manager of sales in the railroad, pig iron and chemical division, INLAND STEEL CO, Chicago. He succeeds **Leon C. Reed,** who is retiring.

John D. Cooney, appointed publicity director, PENN METAL CO., INC.

J. I. Gaisford, appointed sales representative, FAGEOL HEAT MACHINE CO., Detroit.

Richard T. Voelz, appointed field representative, Chicago office, F. J. STOKES MACHINE CO., Philadelphia; and **Truman S. Brown,** named field representative, Los Angeles office.

J. H. BRINKER, appointed assistant executive in charge of distribution, A. O. Smith Corp., Milwaukee.



PAUL W. PHENEGER, named general superintendent, Ordnance Clad Metal Plant, Superior Steel Corp.

JAMES D. YOUNG, named general sales manager, The Yale & Towne Mfg. Co., Stamford, Conn.

J. HERBERT MORGAN, appointed general purchasing agent, Superior Steel Corp., Carnegie, Pa.

Personnel

Continued

W. A. Finn, named assistant general sales manager, WORTHINGTON CORP., Harrison, N. J.

James F. Walters, appointed industrial sales engineer, THE PARKER APPLIANCE CO., Cleveland.

Robert M. Kennedy, named director of employment, safety and welfare, MACKINTOSH-HEMPHILL CO., Pittsburgh, succeedng Irvin A. Brinkman who is retiring.

Fred D. Martin, appointed plant manager, SPEER CARBON CO., St. Marys, Pa.

Kendrick M. Hickman, appointed assistant sales manager, Ewart Plant, Indianapolis, LINK BELT CO., and **Carl Rudman,** named manager of agricultural sales.

John A. Clark, Jr., becomes controller, WARNER & SWASEY CO., Cleveland.

Captain Leo B. Farrell, USN (Ret.), becomes director of regional sales, SEAPORCEL METALS, INC., Long Island City, New York.

Thomas W. McKee, named general sales manager, CASE CHEMICAL CO., Cleveland.

Samuel D. Kapelsohn, appointed manager, Construction Dept., LURIA ENGINEERING CO.

W. C. Berg, Jr., becomes sales engineer, CONTINENTAL FOUNDRY & MACHINE CO., Chicago and Pittsburgh.

OBITUARIES

Andrew Jackson Higgins, Sr., founder and first president, Higgins, Inc., New Orleans.

Oliver F. Mann, 70, superintendent of the Moore Machine Co., Everett, Mass., recently.

Allen J. Armstrong, vice-president, The Texas Steel Co.

S. W. Sparrow, vice-president in charge of engineering, Studebaker Corp., South Bend, Ind., in an automobile accident, recently.

John A. Zapf, chairman of the board, Schultz Die Casting Co., Toledo.

Whipple Jacobs, 55, president, Phelps Dodge Copper Products Corp., at his home, recently.

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Technical Articles

Self-Baking Electrodes Spur development of BIGGER, BETTER FURNACES

By M. O. Sem
Technical Director
Elektrokemisk A. S.
Oslo, Norway

Larger, simpler and improved electric furnaces have resulted in Europe from reliable operation of continuous, self-baking electrodes. Mechanically charged open smelting furnaces have been designed with swingable, charging chutes in capacities to 30,000 kw. Covered furnaces permit collection of waste gases for further use in the plant, in some cases for burning limestone. The rotating hearth furnace has proved its worth in production operations. Smelting craters move away during operation and crater walls do not become clogged by dust and slag. Savings in both coke and limestone have been reported for an 18,000 to 20,000 kw unit installed in Sweden. Lower electrode consumption and cleaner operation are claimed.

Reliable operation of a continuous, self-baking electrode unimpeded by limitations in regard to shape, cross section and electrode length that necessarily characterize pre-baked electrodes is now possible in electric smelting furnaces. It was first necessary to find a good constructional form. The first stage in the development of electrode equipment only consisted in replacing the pre-baked electrodes in existing furnaces with Soderberg electrodes.

Soderberg electrodes soon began to exert an influence on the design of the electric smelting furnace proper. This influence has made itself felt in three different ways: (1) Larger smelting furnaces could be built, (2) in large smelting furnaces it was found practical to use electrodes arranged in a triangle, (3) the construction of covered smelting furnaces was made very much easier.

The development of the Soderberg electrode in Europe involved the design of larger smelting furnaces. A similar increase of the furnace sizes took place in America where it resulted in the production of continually larger pre-baked electrodes, which today run to diameters of approximately 40 in. It was the Soderberg electrode that opened the road for these developments. It resulted in a strong reaction from the electrode factories, who improved their electrode nipples and started producing large nipped electrodes. In this way healthy competition was started between the two electrode systems.

In the changeover to Soderberg the usual rectangular shape of the electrodes was changed to a circular shape. Electrodes of oblong cross section were also used. Elektrokemisk primarily concentrated on the use of round electrodes, even in furnaces with electrodes arranged in line because the casing design was simpler and cheaper. It is, however, still an open question whether the oblong or the round electrodes are the more efficient.

The first large smelting furnaces with round Soderberg electrodes in triangle were built by

"Industries can not long afford to continue letting these gases burn up unused . . ."

A/G fur Stickstoffdunger, Knapsack b/Cologne. This firm developed a bus bar system, later popularly called the Knapsack connection, which via Elektrokemisk became practically generally adopted in such smelting furnaces. The electrodes are connected in delta. The furnaces were at the same time provided with mechanical charging by means of swingable charging chutes, Fig. 1.

Furnaces of this type were built in sizes of up to 18,000 kw and later 22,000 kw. The largest furnace of this type was a 30,000 kw open carbide furnace built at Muckenberg, Germany. It had three Soderberg electrodes of 1.5 m diam. As far as is known, the furnace, which apparently worked very well, was dismantled by the Russians. Its subsequent fate is unknown.

To the electrode holder design were gradually added devices for remote control and regulation of the slipping of the electrode.

In this way, an open furnace equipped with Soderberg electrodes has gradually been developed that in all principal respects satisfies requirements. However, in all these furnaces the furnace gas is lost. The gases from a carbide furnace have a calorific value (combustion value plus heat content) corresponding to a good 30 pct of the furnace load, and in an electric pig iron furnace as much as 78 pct of the furnace load.

It is clear that the industries cannot in the long run afford to continue letting these gases burn up unused. The gases also cause great loss of materials, as the smoke from the smelting furnaces carries with it large quantities of fines from the charge as well as evaporated and combusted fumes that are spread over the neighborhood. The smoke problem is so serious in a great number of carbide and ferroalloy plants that the authorities continually urge that the smoke be rendered harmless.

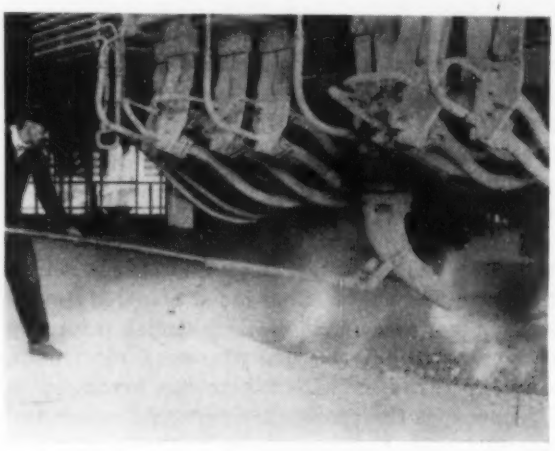

FIG. 1—Swingable charging chutes on electric furnaces permit mechanical charging. European furnaces of this type have been built in sizes up to 30,000 kw using self-baking electrodes of the type described here.

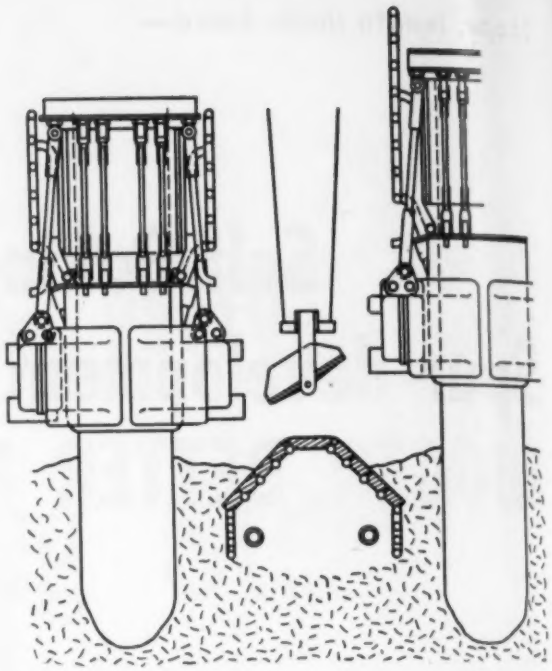

FIG. 2—Modern gas collecting bridge can be positioned in the charge between two rows of electrodes. In some plants collected gas is used for other heating operations.

One of the principal difficulties in the construction of a covered electric smelting furnace is that the roof is a very great hindrance to the furnace attendants in their work (poking) in the furnace during operations.

In an open electric smelting furnace it is an easy matter to get at the furnace for poking, and thereby break down "hangings" and prevent cave-ins and eruptions. All such work in carbide and ferroalloy furnaces was formerly done by hand with iron rods and wooden poles. In later years, mechanical stokers have been developed which do excellent work in open ferroalloy furnaces. Such stokers cannot, however, well be used in covered furnaces. Such tests as have been made in this respect have not been very successful.

Therefore, the prerequisite for a covered furnace is that it can be operated without the need to use such mechanical stokers. In the so-called Elkem rotating hearth furnace (type Ellefsen), Elektrokemisk has found an aid which can effectively be used to counteract the contracting of the furnace craters with consequent tendencies toward "hangings" and eruptions.

The rotating principle is already in use with good results in open ferroalloy furnaces. Altogether, 8 such furnaces are in operation and 4 are under construction (in five countries) in sizes of approx 5 to 10,000 kw for the production of ferroalloys.

What characterizes a rotating hearth furnace

is that the furnace pot slowly rotates, or more usually oscillates approximately 120°, while the electrodes remain stationary. The smelting craters thus move during operation in relation to the furnace, whereby the charge is renewed during each completed oscillation. The movement of the furnace is ordinarily so slow that 120° of oscillation will take 18 to 35 hrs to complete.

The speed will depend on the speed of smelting of the materials in the furnace craters. As a result of the renewal of the furnace charge, the crater walls will not become slogged and narrowed by dust and slag, but keep more porous and open during operation. This is of importance in the operation of an open furnace, but it is naturally twice as important in a covered furnace. The rotating furnace is therefore an efficient means of obtaining even and reliable gas recovery in a covered furnace. We shall later return to this matter in more details in connection with the new Elkem carbide furnace.

Before the development of Soderberg electrodes, the German engineer Walther at Mitteldeutsche Stickstoffwerke had introduced partial gas collection in carbide furnaces equipped with packet electrodes arranged in line. Fig. 2 shows a modern gas collecting bridge of this type which is positioned in the charge exactly between two rows of electrodes. This design did not give really satisfactory results until in connection with the introduction of oblong Soderberg electrodes in the years 1936-38.

When Germany then started large-scale expansion of carbide production before and during World War II, aiming at the production of Buna rubber and other organic products, it was this type of furnace on which production was based. The large plant Schkopau was soon equipped with seven such furnaces of approximately 20,000 kw each. During the war other plants were added, one at Ludwigshafen, one at Trostberg and one at Furstenberg an der Oder. This latter furnace did not, however, come into operation before the plant was captured by the Russians, who then dismantled it.

Fig. 3 shows a furnace of this type. The furnace works very well, provided the materials have satisfactory porosity. The gas yield is, however, normally only about 35 to 50 pct of theoretical amount. A gas analysis shows: 55 to 60 pct CO, 10 pct H_2, 2 pct CO_2, remainder N_2.

In certain plants the gas is utilized for the burning of limestone, while other plants have not found the gas collection sufficiently reliable to base any particular operation on its utilization. In this case the gas is burned like a torch on the roof. There is nothing to prevent the use of this gas collection method also with electrodes of a circular cross section. However, with these electrodes the design has been further advanced and the furnace provided with a roof, thereby permitting total gas collection.

One of the first problems tackled by Elektrokemisk in connection with the design of covered smelting furnaces with Soderberg electrodes, was the designing of an electric pig iron furnace in which coke could be used as reducing agent. Cooperation was established between the leading steel plant in Norway, Christiania Spigerverk, Elektrokemisk and the Norwegian government and a low shaft furnace was developed which became generally used for electric pig iron smelting and known as the Tysland-Hole furnace.

The first of these iron furnaces had circular electrodes arranged in line, Fig. 4. They were built in sizes of up to approx 8000 kw. In 1935, the first 10,000 kw furnace with electrodes arranged in triangle was installed by Imatra

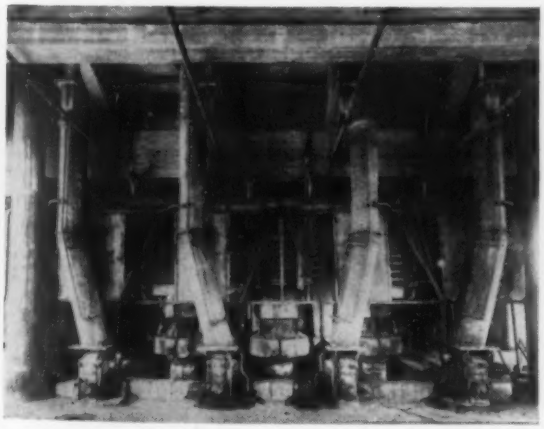

FIG. 3—German furnaces at Schkopan, used during World War II for production of carbide, were equipped with gas collecting bridge. Gas yield ran 35 to 50 pct of theoretical yield with analysis of 55 to 60 pct CO, 10 pct H_2, 2 pct CO_2, and balance N_2.

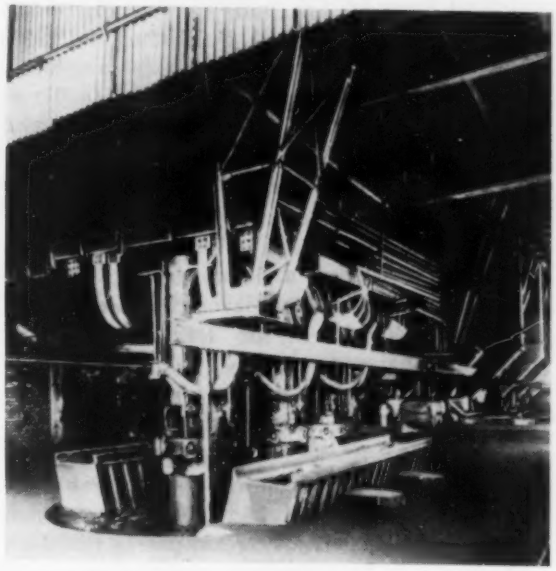

FIG. 4—Electric pig iron smelting furnaces of the Tysland-Hole type designed with circular electrodes in line.

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"TVA in the U. S. has tried out a rotating hearth furnace to produce phosphorus . . ."

Jarnverk in Finland. The furnace was designed by Elektrokemisk. This furnace type exists today in several different forms, the more recent with three charging shafts arranged symmetrically around each electrode, Fig. 5.

All these 10,000 kw furnaces have electrodes of approximately 1050 mm diam. There is, however, nothing to prevent an even greater increase in the size of electrode. Soderberg electrodes of up to approx 2½ m diam have already been used for many years in various single-phase furnaces. In three-phase furnaces, up to 1500 mm diam electrodes have been installed.

Three furnaces with electrodes of this size will be installed at the Norsk Jernverk's plant at Mo-i-Rana. These furnaces are expected to develop 18 to 20,000 kw each. In order not to reduce the power factor too greatly on the transmission line, large electric condenser batteries will have to be installed on the high tension side. These furnaces constitute an interesting development which may have considerable influence on the design of large smelting furnaces in the future.

Another interesting furnace type whose development is closely connected with the Soderberg electrode, is the electric Elkem furnace for the smelting of copper concentrate (Westly system). Jens Westly had already experimented with this furnace at Sulitjelma Smelteverk before and during World War I.

With the development of Soderberg electrodes of sufficient cross section, a 2500 kw copper matte furnace with 34 in. diam electrodes was first built by Anaconda (1924). There followed an installation at Sulitjelma in 1928, where the testing of the furnace was completed. The Outokumpu furnace in 1935 had 1400 mm diam electrodes, Fig. 6. Later on, the well known Petsamo furnaces were built with six Soderberg electrodes in line in a rectangular furnace.

Boliden in Sweden also built a furnace of this type. By the use of a dried charge, a power consumption has been achieved that does not lie much over 400 kw-hr/ton solid charge. The electrode consumption varies between approximately 2½ to 4 kg/ton, according to the analyses of the charge, etc.

Before the last war I. G. Farbenindustrie developed a covered phosphorus furnace equipped with three Soderberg electrodes of 1400 mm diam. Fearing electrode breakages in the deep furnace used, the electrode holder was here designed as a submerged holder lowered down into the furnace through the roof. The length

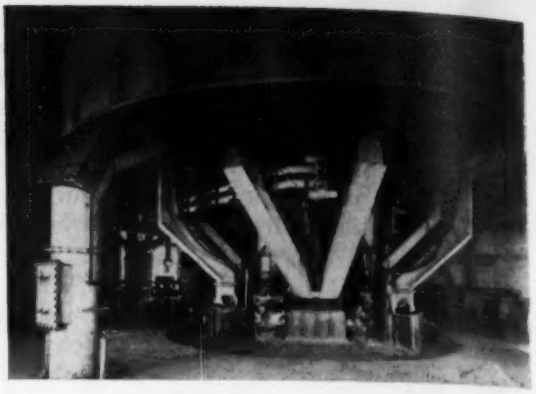

FIG. 5—First furnace, 10,000 kw, with electrodes in triangle was installed by Imatra Jarnverk, Finland, in 1935. Charging chutes are arranged symmetrically about each electrode.

of free electrode was thereby considerably reduced.

Since the war T.V.A. in the United States has tried out a rotating hearth furnace for the production of phosphorus. After successful tests with a small 1500 kva furnace, a 7500 kw furnace of this type has now been started. It is, however, still too early to comment on the results. Experience hitherto has indicated that the furnace can work with a charge of considerably less porosity than hitherto employed.

Elektrokemisk has designed a covered rotating furnace for carbide that has now been in operation for more than 2 yr at Fosfatbolaget's plant at Stockvik near Sundsvall in Sweden. The layout of the furnace is shown in Fig. 7. The unit is equipped with three Soderberg electrodes in triangle and a water-cooled steel roof. Charging is automatic through charging chutes in connection with low shafts arranged at a certain distance from each electrode and distributed around same.

Gas is collected according to the same principle as used in the Tysland-Hole furnace, i.e. around each electrode, being led out into a com-

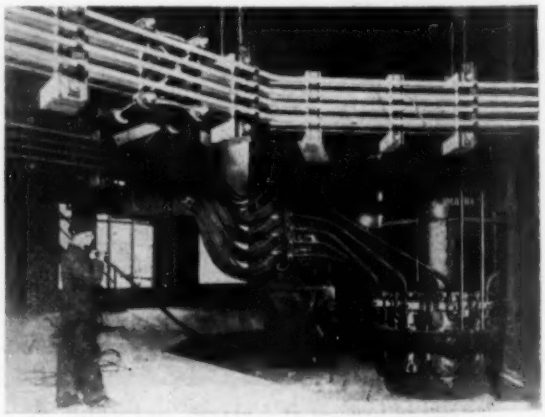

FIG. 6—Increasingly larger electrodes could be used as a result of development of self-baking electrodes and other engineering concepts. The Outokumpu furnace set up in 1935 had electrodes 1400 mm in diam.

mon furnace room and from there to a gas cleaning plant. Or, it may be led to the top of the building for combustion in open air. The electrodes and the roof are stationary, while the circular furnace pot is mounted on a turntable which can be slowly rotated or oscillated during operation.

Between the furnace roof and the furnace pot is a sand seal. There are large inspection hatches in the roof which can be used for keeping a check on furnace operation, and also for cleaning out dust accumulation as required or for inspecting the interior of the furnace. The furnace is also equipped with small openings for poking, normally only used when measuring the depth of the electrodes.

Due to a lack of electric power, the furnace has so far only been operated on full load for a few months. Maximum load has been about 17,000 kw, but it is probable that the furnace will be able to operate on 18,000 to 20,000 kw if sufficient power can be obtained.

It is still too early to give a detailed report on the operational results of this furnace. However, it seems to show a considerable saving both in coke and lime consumption as compared with an open furnace. The electrode consumption has been approx 25 pct lower than in an open furnace. During the first 18 mon of operation the shut downs for repair have only amounted to 1.7 pct.

Rotating furnace less sensitive to fines

It may reasonably be expected that the rotating furnace, which will keep itself clean during operation will give a more constant campaign that that of a stationary furnace.

It has been confirmed during operation that the rotating furnace is less sensitive to fines in the charge than is a covered carbide furnace of American design.* In this furnace the fines must be screened with special care, or else operation will be greatly hindered by the formation of "hangings" and subsequent cave-ins in the furnace, due to the gas yield being insufficiently steady. Fines from this screening are usually smelted in open carbide furnaces. It will therefore be difficult to equip a plant with only covered furnaces of this type. Actually the furnace at Stockvik is charged with the same charge as the open furnace without inconvenience. Even if a rotating furnace should require the screening off of small amounts of fines, these may all be charged into the central part of the furnace, where they will be consumed gradually without causing interruptions in operation. Such charging has been foreseen in the next furnace of this type. It is expected thus to reduce the power consumption.

* U. S. Patent No. 1,922,312.

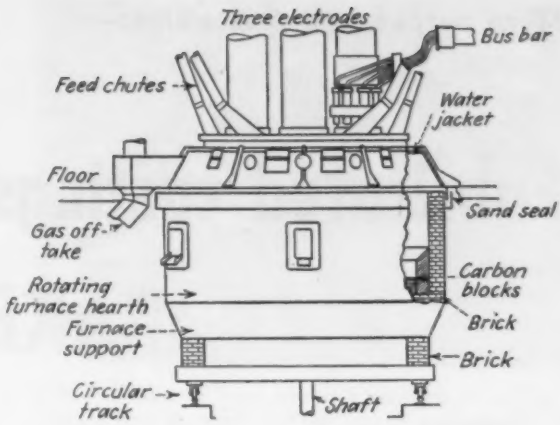

FIG. 7—Schematic drawing of rotating furnace shows layout of sub-floor portions of unit.

According to preliminary results, it seems that about 90 pct of the gas production in the Elkem carbide furnace can be collected. Gas analysis is shown in the table below.

The calorific value of the gas amounts to approx 3.000 kcal/Nm³. Hitherto, variations in the CO content of the gas have only amounted to a few percent. The gas leaves the furnace with a temperature of approx 500 to 600°C. It is used to heat the lime kilns.

Furnace operation has been remarkably even and calm, so that one man per shift can manage the whole attendance of the furnace, apart from tapping. He will actually be able to attend several furnaces of this type simultaneously. An extra man will have to attend the gas cleaning plant.

Several carbide furnaces of this type including two in the United States are at present under construction, in sizes of up to 24,000 kw. Two covered furnaces of the same type are also under construction for ferro-manganese production.

Several years ago, two FeMn furnaces of the Tysland-Hole type were built in Italy, and have given good results. The gas is used in the adjoining steelworks.

When designing a covered furnace it has often been proposed that the size of the furnace be increased by using a greater number of electrodes. Furnaces with six electrodes have, as previously mentioned, long been used in copper matte smelting. A 7-electrode furnace has been proposed for carbide production. It must, however, be remembered that each breakage on one electrode means a stop in operation or at any rate serious disturbance for the whole furnace.

GAS ANALYSIS

Gas	Approximate Pct
CO	90 92
CO_2	1.16
O_2	0.33
H_2	2.05
CH_4	1
Remainder	4

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More output with less weight—

Fabricated castings and plate MAKE LIGHTER PUMPS

By Ray Zeh
District Engineer
Lincoln Electric Co.
Cleveland

An oilfield pump already approached the weight limits for portability, so in designing a new higher capacity unit no more weight could be tolerated. The solution was to replace big heavy castings with weldments combining castings and plate which lightened the unit by 4000 lbs. Castings worked best where shapes were intricate or heavy sections were needed. Elsewhere welded plate provided strength and rigidity with far less weight.

A change in petroleum slush pump design from castings to a weldment composed of castings and steel plate has reduced overall weight by nearly 4000 lb.

National Supply Co., Toledo, O., made the change when it wanted to up the capacity of its Type C-350 pump. Total weight of the C-350 already approached the limits that could be transported conveniently in the oilfields with available equipment, so no increase in weight for the new design could be tolerated. Yet it had to be made stronger to stand up under more power and higher pressure.

Therefore, for the new Type E-500 pump, design was altered to replace the solid castings with combinations of castings and steel plate, in addition to certain mechanical changes, which made smaller size with increased output possible.

One of the most important changes in the new design is in the frame of the power end. This is a combination of steel castings and shaped steel plates arcwelded into a unit structure. The skids are welded from steel beams and plates, much as before, but for strength and stiffness the skid portions below the power and frame are now made integral with the frame by arcwelding. In the type C-350, skids were one continuous structure onto which both the power end frame and the fluid end frame were bolted. The C-350 power end, primarily a single casting, is shown in Fig. 1.

Skids for the Type E-500 power end are bolted to those for the fluid end at vertical joints. The skids under the fluid end are bolted to the fluid end frame as before but constitute a separate unit detachable from the skids of the power end.

Weight saving in relation to horsepower in the E-500 type is attained in part by increasing the crankshaft speed, while holding the average piston velocity substantially the same by shortening the stroke. A more important saving is attained, however, by using the power end frame that is a weldment including steel castings, whereas the corresponding frame in the C-350 was entirely cast in high-strength iron. The E-500 frame is shown in Fig. 2.

The welded structure was not made entirely from shaped steel plates because some of the shapes would have been difficult to build from steel plate. If fabricated they would have required expensive forming and fitting operations and many more welded joints than are needed with the combination of cast and formed steel plate components.

This applies especially to the major casting that connects the box-like gear housing and the end plate that bolts to the cast steel fluid end frame. This intermediate casting makes a ready transition between an oblong opening and an end plate having rounded ends. Although a structure serving the same purpose could be built up by welding shaped steel plates, some of these would require expensive forming and some joints might be rather difficult to weld.

On the other hand, this intermediate casting is not difficult to produce, and it is easily strengthened. Certain openings are easily closed by welding plates to the casting.

Also, the casings used at the bearing support points in the frame are very straightforward

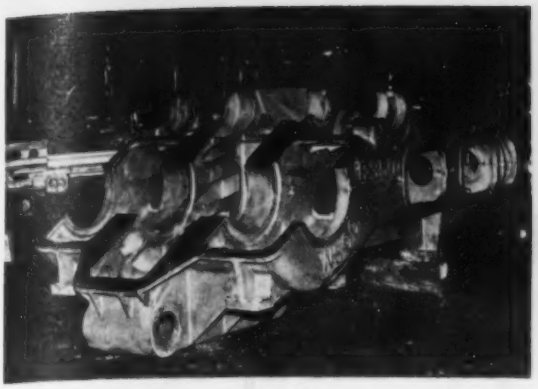

FIG. 1—Power end frame for C-350 pump as cast in steel. This unit approached maximum weight for portability, so new higher-output design went to weldments here to save weight.

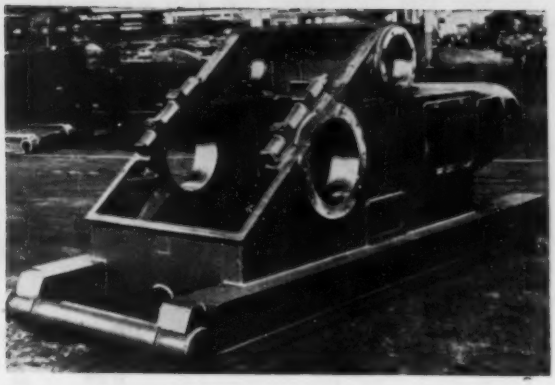

FIG. 2—Power end frame for new E-500 pump as built up by welding from plate and castings. Use of weldment here has cut weight under that of C-350, allows bearing design change.

castings to produce and represent the most convenient means of providing the heavy metal sections required to support the large roller bearings used on the shafts. Other power end frame castings are minor parts.

Most of the welds are fillet types but some are flat seams. Steel plates ranging in thickness from ¼ to 2¼ in. form most of the box-like structure, but it is greatly stiffened and strengthened by welding to the skids which are beams reinforced to form square box sections.

Parts of the main portion of the power end frame are formed also by transverse vertical and horizontal plates welded to side plates and to each other as well as to gusset plates or webs. These add strength and stiffness and minimize deflections. Some of the top and bottom plates are relatively light because they act primarily as oil-tight closures, although they do tie other elements together and add considerably to stiffness.

Clearly, although a structure of similar shape could be cast in steel, many walls would have to be far heavier than they are in the weldment, and this would raise total weight to a prohibitive degree. In the weldment, the steel is well placed with reference to the stresses imposed and the deflections permitted. Still, as the amount and location of all stresses are not precisely known, a considerable safety factor has been allowed by making certain sections heavier than they may need to be. Total weight, however, is estimated at 38,000 lb complete with a quadruple driving sprocket, 3000 to 4000 lb less than for the C-350 design of considerably lower output capacity.

In the new design weldments are not confined to the power end frame and skids but extend also to the eccentric shaft used in place of the crankshaft of the C-350. In the latter the crankshaft is a forged shaft. It has cast steel cranks that overhang the main crankshaft bearings on each side of the main gear. The new design uses an eccentric arrangement instead of cranks, permitting a construction in which the main crankshaft bearings are outside the connecting rods. This eccentric is a welded assembly built up with steel

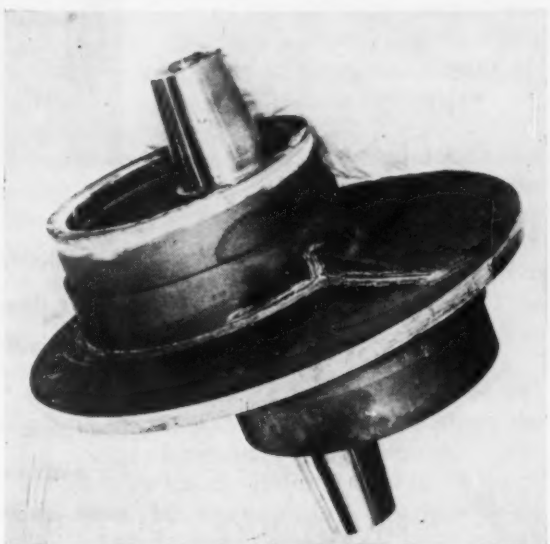

FIG. 3—New eccentric weldment replaces forged crankshaft of old pump. This permits better arrangement of main crankshaft bearings and also reduces bearing load by one-half.

plates and tubular sections and mounted on a through forged steel shaft. It is shown in Fig. 3.

Actually the eccentrics are tubular bosses welded to a circular steel flange 1¾ in. thick. The shaft is inside a tube concentric with this flange. The tube is welded both to the flange and to webs inside the short eccentric tubes. A triangular gusset is welded to each side of the plate at the radius corresponding to the minimum eccentricity of each eccentric. This makes an exceedingly stiff structure that deflects only a slight amount under the loads imposed by the connecting rods and by tooth pressures on the ring gear which is bolted to the flange.

Double-row Timken roller bearings support this crank-shaft. The outer races of these bearings are carried in cages which in turn fit into the heavy bearing supports welded to the frame. This eccentric type construction gives bearing loads approximately one-half those produced by the overhung crank construction.

Instead of a dovetail—

Simple screw machine form tool is 90 pct cheaper

By C. M. Woog
Tool Engineer
Skinner Electric Valve Div.
Skinner Chuck Co.
Norwalk, Conn.

A toolholder which holds two standard carbide blanks replaces three expensive dovetail form tools on a multiple-spindle automatic screw machine job. The job is a stainless steel valve body, machined in three different sizes. Four sizes of blanks are required to give the right pair for each size of body. Total tool inventory for the job has been cut from $900 to $100, a nearly 90 pct reduction.

Standard carbide tools have replaced expensive dovetail form tools in a stainless steel machining operation at Skinner Electric Valve Div., Skinner Chuck Co. The tools are used on New Britain automatic screw machines, for machining valve bodies.

The basic toolholder for multispindle machines is the dovetail form tool holder, which allows a solid clamping. The dovetail tool itself gives heavy support for the carbide insert. Both advantages make it the most widely used tool on multislides. But the initial cost and maintenance are high.

The tool setup at Skinner for a valve body originally called for use of two roughing and one finish dovetail form tools at an average cost of $50, or $150 for all three. With one spare set, the investment was $300. The bodies are produced in three different lengths, making the total tool investment $900. Fig. 1 shows one of these holders. Comparison of these tool costs with standard straight tools at $2 to $3 each led to design of a tool holder for standard ¾ x ¾-in. tools.

Success of carbide tooling depends to a considerable extent on rigidity. The slightest ability of the tool or tool holder to deflect or vibrate will defy the purpose of carbide tooling. This fact is often overlooked, which may lead to a faulty conclusion by a screw machine operator. He may have tried a perfectly ground tool, run at proper feeds and speeds. Still, he gets chatter marks or repeated breaking out of the tool edge.

Eventually he may give up, slow down his machine, and go back to high speed steel operation,

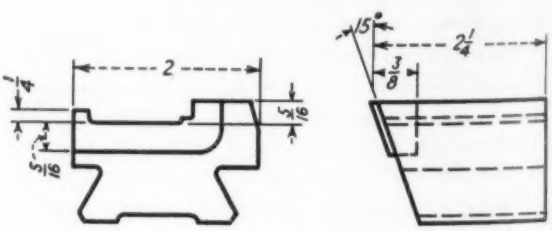

FIG. 1—Conventional form tool designed for machining valve bodies at Skinner, required in three different sizes.

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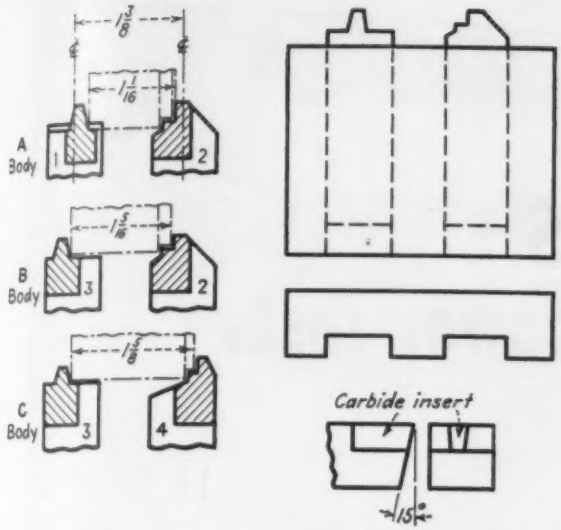


FIG. 2—How pairs of standard carbide tools are mounted in toolholder to do same job as form tool of Fig. 1.

believing that carbide won't work for his application. Experience at Skinner shows that if the spindle bearings and slides of a screw machine are in good condition yet carbide does not work, the structure and support of the setup should be checked.

Therefore rigidity was kept in mind in designing the new tool holder. Any overhang of tools had to be avoided. The plan was to utilize two standard tools, one for breakdown and one for facing and forming of a shoulder. The holder was to be adjustable for the three different valve body lengths.

At first it was considered making the tools adjustable sideways in the holder. But this would introduce a new source of trouble. Instead, the setup was designed as shown in Figs. 2 and 3. Four interchangeable standard tools do all the work on bodies A, B and C. Tools 1 and 2 are used for A, 3 and 2 for B, and 3 and 4 for the C size. Two simple carbide tips, brazed in different positions on the different tools, do the work instead of expensive preformed long tips which cost about $18 and would have to be cast in three different sizes.

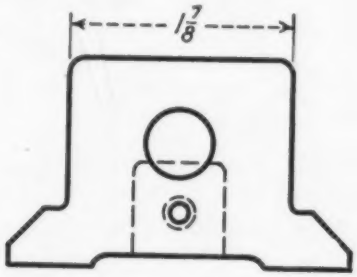
This design eliminates the necessity for relative adjustment of the two tools within the holder. A top plate on the tool holder confines the tool shanks in closely-fitting ¾-in. grooves which prevent any possibility of vibration. The original forward adjustment is done by setscrews behind each toolbit.

The original design provided a cutout 1¼-in. behind the tools to have room to get in an Allen wrench to adjust the setscrews. The result was that even a thrust body of 1¼-in. toolsteel did not supply enough rigidity to allow running the job at intended speeds. This was corrected by welding plate to fill the gap and changing the means of access to the screws.

Cutting oil is supplied through the holder and shoots through the two ¾-in. channels above the tools to give maximum coolant efficiency.

Building two such holders required 44 hr of work. Total cost was $100, in comparison to the $900 investment formerly required.

The 430F stainless steel valve bodies are run at 220 sfpm with this tool.



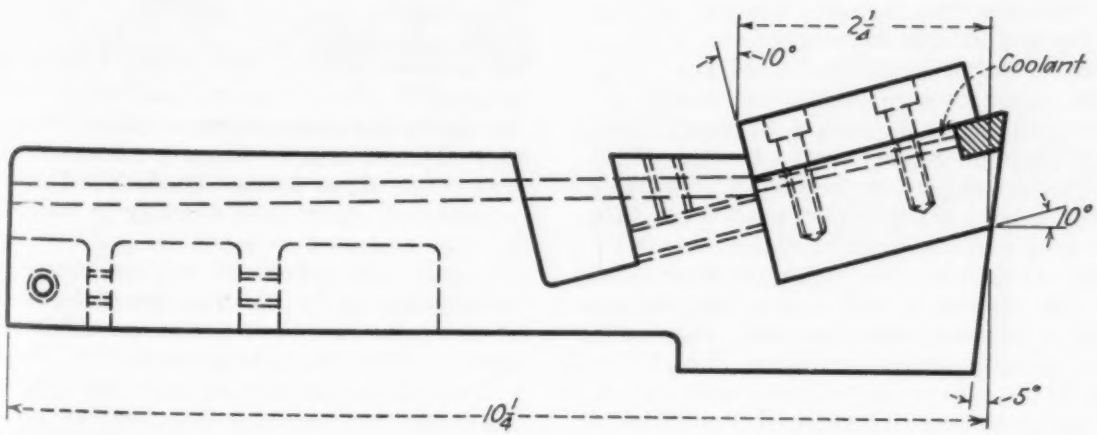


FIG. 3—Drawing of toolholder to hold carbide as shown in Fig. 2. Cost is 1/9 of conventional form tool of Fig. 1.

Electrifying success—

DIESEL CUTS scrap yard power costs in half

By Ben Waisman
President
Consumers Steel & Supply Co.
Racine, Wis.

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For years this scrap yard has found it economical to generate its own power with three small diesel-generators. But they had to run full blast to handle the load. They didn't respond quickly to load changes, sometimes let voltage fall enough so that electromagnets would drop heavy pieces. Now a modern new diesel-generating set handles load easily at half the cost. Costs may drop further when gas is used as fuel.

Installation of a new diesel engine has cut power costs 50 pct at Consumers Steel & Supply Co., Racine, Wis. The new unit replaced 3 smaller diesel generator units. The 530-hp engine is direct-connected to a 320 kw generator. The former units were 66 kw each.

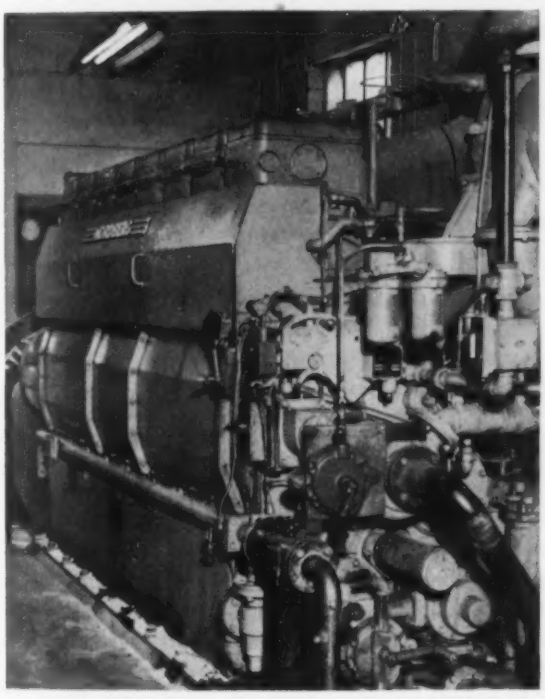
Consumers Steel & Supply Company has one of the largest and most completely equipped yards in the Midwest. The plant now covers seven acres. The equipment for sorting and processing scrap includes a hydraulic press, eight alligator shears, torches, turnings crushers, a pit with a drop for breaking cast iron, two overhead bridge type cranes with 65-in. magnets, and several crawler-type cranes.

When Consumers Steel & Supply began operation its demand for electric current was supplied by the local power company. With continuing plant expansion however, the company turned to diesel power as the most efficient means of electric power generation. Three 135 hp, 66-kw diesel generator units were installed. Later a 115 hp, 50 kw diesel unit was added to help out the three larger units during summer operation.

From the date of installation it was necessary to operate the 135 hp engines at full load to maintain the 240-v output for proper functioning of plant equipment. It was evident after the first years of operation that this installation, though more economical than purchased power, was not the answer to efficient, long range power generation. The variance in load caused by the energizing and de-energizing of the electromagnets resulted in a continually fluctuating demand. The three diesels synchronized at the switchboard, experienced difficulty in maintaining the necessary voltage. Their response to changing load conditions was not immediate. This resulted in the slowing down of the balers, shears and cranes and the occasional loss of heavy material from the magnets.

To stabilize operation and provide more economical power generation with reserve for plant expansion, Consumers Steel installed a Nordberg supercharged diesel engine rated 530 hp at

TWO 65-in. electromagnets serve Consumers Steel & Supply Co. scrap yard. New diesel-generator supplies these, plus equipment with dc motors totalling 420 horsepower. New generator has stabilized yard operations.



NEW GENERATING EQUIPMENT, from power end, is rated 320 kw. Generator is in background. Corner of switchboard shows above generator. Diesel burns oil now, but can burn gas, too. Unit consistently maintains 240-v supply.

600 rpm. This engine, of the four-cycle type with eight cylinders, is direct connected to a 240-v, three phase, 60-cycle, ac, 320-kw General Electric generator. Although of Duafuel design, the engine is now operating on straight diesel fuel oil pending negotiations with the local gas company. The new unit consistently maintains the 240-v supply, and has a marked sensitivity to changing load conditions. No matter how heavy or sudden an increase, the new engine picks it up quickly.

Current from the diesel generator is fed through a switchboard to three motor generating sets where the current is transformed from ac to dc for use by the yard equipment, whose equipment power requirements total 420 hp. Oil is stored in a 20,000-gal horizontal tank. Fuel is pumped from storage through filters and meters to a 300-gal day tank in the engine room. A fuel oil booster pump draws fuel oil from the day tank and puts it through an engine mounted filter to the engine header and the individual fuel injection pumps.

Detergent-type oil is circulated under pressure to lubricate bearings and cylinders and cool the pistons by an engine-driven pump. Oil is cooled by a shell-and-tube type heat exchanger.

The Nordberg engine has its own closed jacket water system. Soft city water is circulated by an attached centrifugal pump through a vertical radiator with a regulating valve that automatically keeps the engine at the desired temperature.

Air is drawn from outside through a panel type air filter and supplied to the intake header by an Elliott turbocharger. Exhaust gases are carried to the outside through a Burgess Manning snubber.

Comparison of operating records indicates during the unit's first two months of service it consistently maintained its load while reducing fuel costs approximately 50 pct. In this period the engine operated 16 hours a day on a 6-day-week schedule. Further economy is expected when the engine is put on Duafuel operation.

Bauschinger effect, 70 yrs too soon—

Metals Can Be Softened BY COLD WORK

By N. H. Polakowski
University College
Swansea, England

Cold working is a partially reversible process. A metal can be work hardened by plastic deformation of one type and then work-softened, within limits, by plastic deformation of a different kind. The only reasonable explanation of why and how this is possible is found by applying the "Bauschinger effect" principles. These, when properly interpreted, can account for the remarkable fact that hard-worked metals may be softened by application of cyclic deformation, without being heated. Even steels hardened by heat treatment can also be softened to some extent.

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The phenomenon observed first some 70 years ago by Bauschinger does not seem to enjoy much popularity between metal engineers and scientists. Many recent books devoted to physical metallurgy or to processing and testing of metals do not even mention its existence. This attitude may lead many to believe that the "Bauschinger effect" is apparently just a little curiosity of third-rate importance in every day's problems.

The writer of this article has investigated for some years this and related phenomena and came to a conclusion that B-effect, if properly interpreted, is helpful in explaining various facts which puzzle metallurgists in their daily practice.

If a rod of ductile metal is permanently stretched at room temperature its resistance to further elongation is thereby raised to the value of stress (or load) applied. This is caused by work-hardening during plastic deformation. However, if the same rod after the initial stretch is retested in compression it will be found that the metal flows under stresses much below the tension applied previously. In other words, a ductile metal after stretching has a higher yield strength in tension than in compression. Likewise, after initial pre-compression the yield strength in subsequent tension will be relatively low, and the same will be found when torsion in one direction is followed by untwisting. It is this differential or directional effect of cold-work on the yield strength that is termed "The Bauschinger Effect."

The conventional explanation of the B-effect is based on the assumption that the individual crystals forming the metallic mass are randomly orientated. For this reason their resistances to deformation by an external stress act-

"Single crystals show B-effects in a degree comparable with the polycrystalline metals . . ."

ing in a given direction must differ. On application, of a tensile stress, to a specimen, those grains will first yield which are most favorably oriented for plastic deformation. As the external stress is continually increased, the actual stress increases less rapidly in the weak grains which flow plastically than in those which, due to their unfavorable orientation, remain elastic. If the external stress is now removed, the relatively strong grains which carried the highest peak tensile stress will tend to contract elastically thus exerting a compression on the adjacent crystals. Upon application of a compressive stress to the specimen, these crystals which are already in a state of residual compression will yield under a small additional stress thus reducing the overall yield strength.

On this concept, one would expect good single crystals not to exhibit a B-effect. Unfortunately this is not the case, and single crystals produce B-effects in a degree comparable with polycrystalline metals[1,2]. The reason is that single crystals may apparently contain residual stresses just like ordinary metals. For the present purpose the practical implications of the B-effect are of interest and not the exact mechanism which causes it.

High-carbon steels possess a much stronger matrix than do the low-carbon materials, and it can be expected that they will carry larger intergranular elastic strains and will therefore exhibit more pronounced B-effects. This

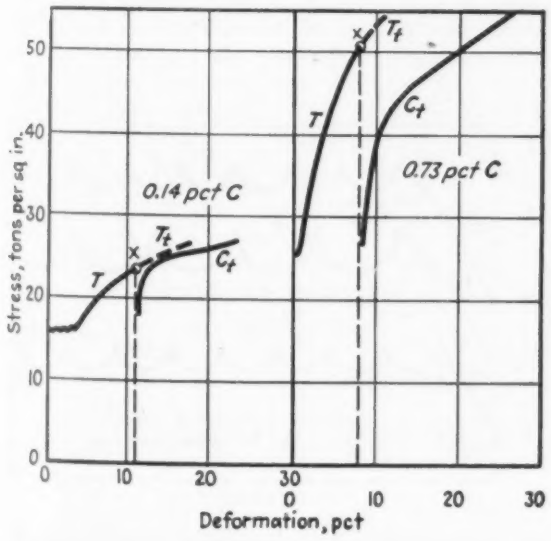

FIG. 1—Bauschinger effects in low- and high-carbon steel. T—initial tension; T_t—continued tension following T; C_t—compression following T, showing reduced yield strength.

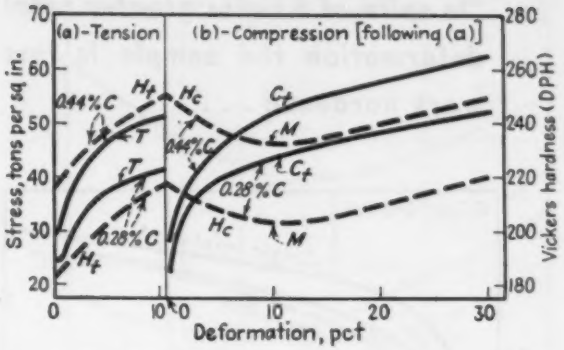

FIG. 2—Bauschinger effects and work-softening of medium-carbon steel when compressed after initial pre-stretching. T, C_t — stress curves; H_t, H_c — Vickers hardness curves V. percent deformation.

is true, as is seen in the two diagrams in Fig. 1.

The stresses in Fig. 1 are obtained by dividing the applied load by the actual cross sectional area of the specimen at each stage of deformation. The deformations in tension are taken as $(1 - L_o/L) \times 100$ pct, those in compression as $(1 - H/H_o) \times 100$ pct, in which L_o and L denote the initial and actual distance between the grips of the extensometer, whereas H_o and H denote the initial and actual height of the compressed test piece. The latter had the form of small cylinders cut from the tensile specimens which have been first stretched in the amounts indicated by the vertical dashed lines. It is apparent that the difference between the tensile and compressive yield strengths is much greater in the pre-stretched 0.73 pct C-steel, both absolutely and percentually.

Cold working is a partially reversible process and the following question arises in connection with the B-effect: "Is plastic deformation in reverse direction accompanied by additional hardening or by mechanical softening?" This question cannot be answered by reference to the stress-strain diagrams in Fig. 1 because in either case the C_t-curves rise in the usual way, quite irrespective from the initial low yield strength values. What is required is a test which will determine not the instantaneous behavior of the metal under stress, but its condition. The yield strength is not a measure of the condition of a metal strained in a direction opposite to that of the initial prestraining since by varying the latter one can easily make the hard high-carbon steel to appear to be "softer" than a low-carbon metal. This can be ascertained from Fig. 1 and is naturally caused by the more powerful B-effect in the high carbon material.

The simplest test determining the condition of a metal is a plain hardness test, whether Brinell, Vickers, or Rockwell. It takes in account both the original, inherent hardness and also the additional hardening caused by cold

"In spite of 6 times greater total deformation the sample is less work hardened . . ."

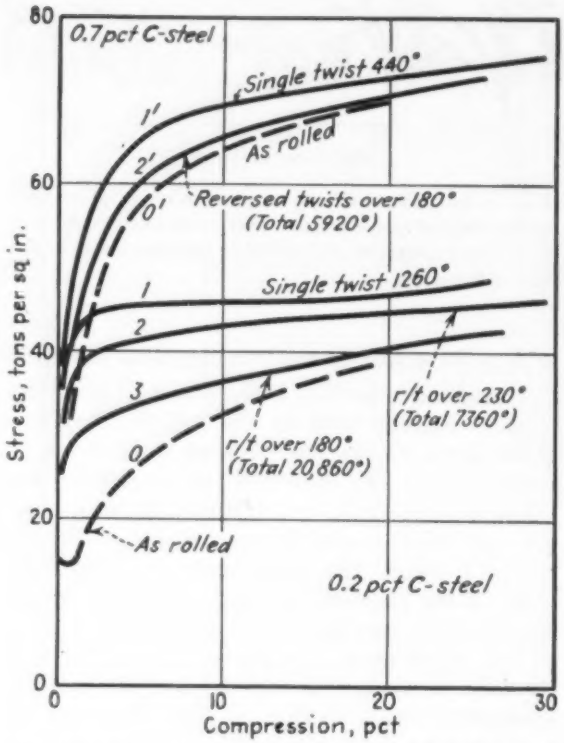

FIG. 3—Compression tests on low- and high-carbon steels subject to torsion as indicated.

working. A cold worked metal when tested by the indentor will always be found harder than it was in the annealed state, irrespective of the direction in which the hardness test is performed.

When such hardness tests are made at various stages of "reversed deformation," some remarkable results are obtained as shown in Fig. 2. These experiments were carried out on normalized steels with 0.28 and 0.44 pct C. The rods were first deformed 10.5 pct by stretching (T-curves), removed from the tensile machine, and cylinders suitable for compression tests were cut off the gage length portion. These were faced and compressed in small stages between well lubricated polished anvils. Two C_t curves were obtained showing strong B-effects in each case.

The hardness increased during the initial extension (H_t-curves). But upon subsequent compression instead of further hardening the specimens begun to soften, reaching a minimum hardness after about 10 to 12 pct compression (points "M" on curves H_c). From that point the steels started to harden again, after 10.5 pct extension followed by 30 pct compression the samples were no harder than after the first 10.5 pct stretching alone. With lower-carbon steels (0.02 to 0.18 pct) the maximum drop of hardness at "M" was only between 5 and 13 DPH, but with steels of 0.7 to 0.9 pct it reached 26 points. In general, the stronger the B-effect, the more prononunced is the attendant mechanical softening. Changes are also found in X-ray diffraction patterns and in other physical properties.[3]

The fact that a cold-worked metal can be made softer by purely mechanical methods is remarkable in itself. However, its further implications are believed to be even more striking. Turning again to either of the two H_c-curves in Fig. 2, let us imagine that compression was interrupted at 20 pct deformation, hence a little after point M has been passed. If the direction of straining is now reversed again, i.e. from compression to tension, it is reasonable to expect that there will be another B-effect (reduced yield strength), and also that this will be accompanied by work-softening followed by hardening when point M is passed in the opposite direction.

This procedure can be repeated many times more, and if the range of deformation is not large, say of the order of several per cent in either direction from the zero position, one should be able to knead the metal repeatedly without altering its mechanical properties. This has been proven in both laboratory experiments and industrial practice.

Suitable experiments can be made by using short cylindrical test pieces with screwed heads which may be strained by both tension and compression without buckling. Such tests are, however, rather costly and troublesome because the cylindrical portion becomes disfigured after a couple of 10 pct deformations in either direction. As an alternative, reversed bending, or still better, repeated reversed torsion can be employed. Typical results obtained by the latter method are displayed in Fig. 3.

The lower set of curves in Fig. 3 represents

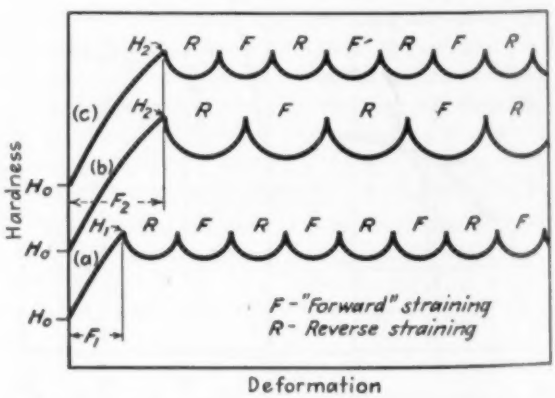

FIG. 4—The effect of cyclic deformations on work-hardening (illustrating diagrammatially the results in Fig. 3. H_o — initial hardness; F_1, F_2 — initial deformation resulting in hardness H_1 and H_2 respectively.

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results of compression tests on pieces cut from ½ in. diam. torsion specimens which were strained by cyclic torsion of varying amplitude. Curve 1 represents a test on a specimen which was twisted till fracture. The second rod, curve 2, was twisted back and forth 32 times over a 230° angle and yet in spite of the nearly 6 times greater total deformation (7360° against 1260°) this sample is apparently less work-hardened than the former. The third specimen, curve 3, received again about 3 times more twisting than the second, but the cycle was here only 180°. This rod is finally still softer than the preceding one.

The upper curves for a high-carbon steel with 0.7 pct C are self explanatory although it is noticeable that they lie closer to one another than in the 0.2 pct C batch. This effect can be understood from a comparison of Figs. 1 and 3 and is due entirely to the strong B-effect in the harder material. If the two C_t-curves in Fig. 1 are shifted to the left to have one deformation scale for both tension and compression, the diagrams will be closely similar to those in Fig. 3.

The values of surface hardness followed one another in the same order as the compression curves. Thus the Vickers numbers of the 0.2 pct steel were: 130 (0), 213 (1), 195 (2), and 176 (3). For the high-carbon metal: 245 (0′), 274 (1′), and 262 (2′). These values, except 0 and 0′, were reached after a few cycles and did not alter later, except on the small cyclic changes during each turn as shown diagrammatically in Fig. 4.

The diagrams are believed to be self-explanatory. But as drawn in Fig. 4 the general hardening level should be determined solely by the magnitude of the first prestrain (F_1 or F_2). This is not exactly the case and the amplitude of the subsequent cycles has a slight influence on the final hardening which is somewhat higher for the greater alternating strain. However, this effect may be safely disregarded in qualitative considerations.

The simple experiments just described and their interpretation in Fig 4 explain the anomaly that flattening of steel sheets in roller levelers results in very little work-hardening.

EFFECT OF ROLLING DIRECTION ON HARDNESS

Metal	Reduction by Rolling, Pct	Vickers Hardness Number	
		After Rolling in One Direction Only	After Rolling with Different Direction in Each Pass
Copper (99.95 pct)	97	133	114
Silver (999 fine)	96	105.7	100.0
Aluminum (99.98 pct)	95	40.7	35.9
Aluminum (99.2 pct)	0	38.6	38.6
	23	48.6	42.6
	50	51.5	45.3
	74	61.1	49.7

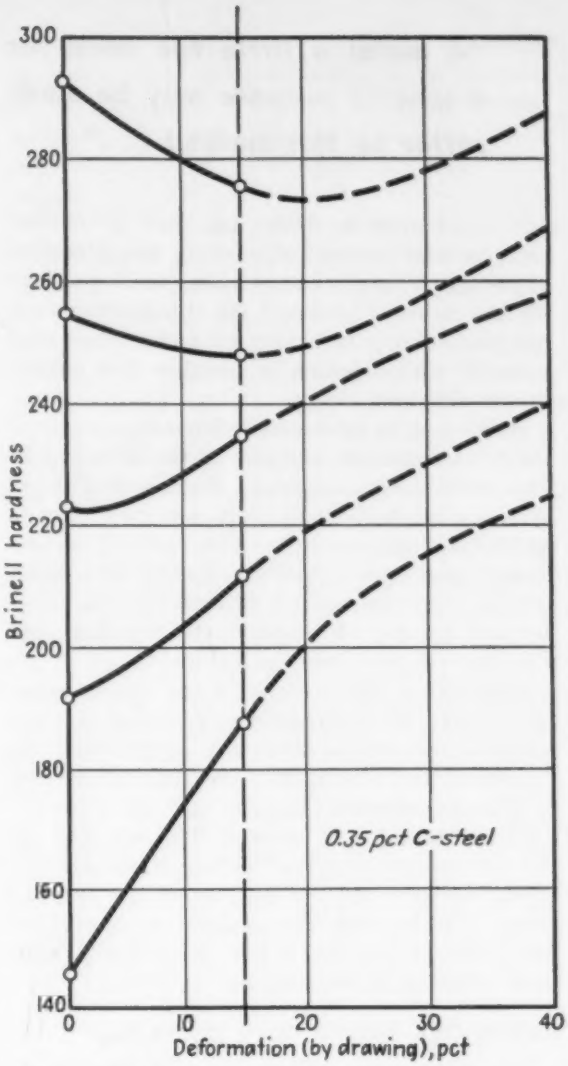

FIG. 5—Hardness of 11/16 in. diam steel rods after overleaf different heat-treatment (values for deformation — 0) and after a subsequent 15 pct draft through a die in each case.[5] The dashed lines are plausible extensions of Armour's experimental results.

Motor body sheets are about 0.040 in. thick and are flattened in processors equipped with a dozen or so 2.5 in. diam rolls. Quite often this procedure is again repeated in the press plant in order to make sure that no stretcher strains will appear on the surface upon pressing. Under these conditions, a single bend will result in a $0.040/2.5 = 0.016 = 1.6$ pct strain in the outer fibers of the sheet, and twelve repetitions would have to produce well over 10 pct total or equivalent deformation. If the sheets were really work-hardened to such a degree, they would be useless for most deep drawing.

What actually happens is that the metal hardens a little in the first bend but most of the cold-work is extracted back on unbending, it hardens once more in the next bend in the opposite direction and is again softened later. The process thus proceeds on the lines of series (c), Fig. 4. Since the sheets are as a rule tem-

"A metal a little too hard for a specific purpose may be made softer by this method . . ."

per rolled prior to flattening, their grains become to some extent aligned in the direction of rolling. This alignment makes the conditions for the internal back-and-for slip during leveling particularly favorable with the result that virtually no hardening is added to that caused by the skin-pass alone.

Hardening by cold-rolling depends not only of the total reduction but also of the direction in which the individual drafts are taken. For example, when a sheet of aluminum or copper is passed through the rolls in the same direction in each pass, it will finally be harder than when the direction of rolling is altered each time. Typical results of experiments showing this phenomenon are given in Table I.[4]

Here again the work-softening effect seems to operate. Work-hardening in rolling is a result not only of the reduction of thickness by squeezing but also to the shearing forces due to friction between the rolls and the material. This additional cold work is demonstrated by the differential recrystallization characteristics of the surface and the interior of the reduced sheet. On heating the surface recrystallizes first thus showing that it has received relatively more effective demonstration.

Rolling Can Reduce Work Hardening

By altering the rolling direction after each pass, for example by reversing the mill or by presenting to the rolls the leading and trailing ends alternately, the surface of the strip will be sheared in opposite directions. The extra surface hardening introduced in one pass will be cancelled out in the following one and after a number of passes the material will be ultimately less work-hardened.

It is generally recognized that work-hardening is associated with an accumulation of internal strain energy in the deformed metal. Any method of cold working will tend to build up inside the material a complex system of internal strains and stresses characteristic for the particular deformation process employed. Thus compression will create an internal strain pattern different from that produced by drawing, rolling, stretching, and so forth. But when a rod is first reduced by drawing and later compressed axially, the compressive stress will tend to generate a strain pattern specific for compression, quite irrespective of that which existed in the metal previously. Before a new strain pattern can be produced the one which existed previously must be disintegrated or broken-down. Such break-down is associated with a fall of the internal energy or, in other

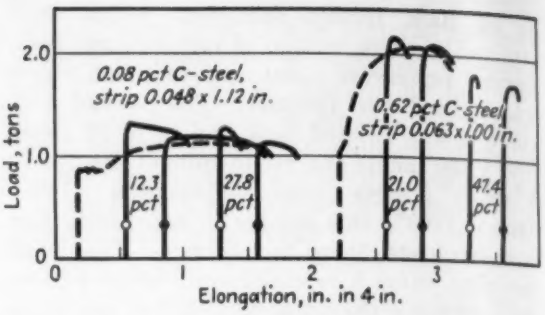

FIG. 6—Effect of reversed bending on tensile properties of freshly cold-rolled carbon steel strip. (o) Material rolled to the reductions indicated; (o) like (o) but flexed in addition 5 times for and back over 2 in. diam.

words, with a transient softening. Only when the original strain system is completely "stripped off," a condition corresponding to points M in Fig. 2, can further hardening commence again.

The greater the difference between the internal strain patterns due to the "first" and "second" deformation methods, the more pronounced will be the B-effect and the attendant softening. Drawn rods or cold-rolled strip will thus produce a slight B-effect upon stretching as demonstrated by a smoothly rounded extensometer curve without a clearly defined boundary between the plastic and plastic ranges. When the same materials are compressed axially, i.e. in a direction opposite to the original elongation, the B-effect will be very strong and the slope of the deformation curve is considerably depressed.

The behavior during cold-working of steels which were hardened by heat-treatment is a most striking demonstration of the internal strain energy concept mentioned above. Quench-hardening of a steel obviously leaves it in a highly stressed condition and these stresses are not eliminated by tempering up to 500° C. The internal stress pattern in such steel is necessarily different from that created by any method of cold working. Therefore, plastic deformation of a quenched and tempered (or patented) steel must bring about a breakdown of the internal strains set up by heat-treatment and thereby result in transient softening.

The first confirmatory results in this connection were shown, in the writer's knowledge, by Armour[6] in 1930, and these are plotted diagrammatically in Fig. 5.

As long as the steel is soft and relatively stress-free, a 15 pct reduction by drawing results in hardening, as expected. However, as the initial hardness increases, the amount of hardening caused by cold work is becoming less and at about 280 Bhn in the as-heat-treated condition, additional cold-work produces softening. This softening is due to the breakdown

of the stress-system left after heat treatment and it can be caused not only by drawing but also by rolling, or even by stretching in a tensile machine. If drawing or rolling is continued, the original stress-structure will be finally disintegrated completely and then the metal will begin to harden again. But in many cases there will be virtually no hardening at all till 30 to 50 pct reduction is revealed. This is frequently observed when cold drawing patented wire.

Softening of cold-worked metals deformation can also be produced by cyclic as portrayed in Fig. 6. The dashed lines refer to the soft, annealed strip. After the reductions by rolling indicated, the extrusion curves acquired the shapes marked with open circle. The strips were then flexed a few times over a 2 in. diam. and again tested in tension. This time the curves with the black circles were obtained and in each case not only was the yield strength reduced compared with the as-rolled state but also the total elongation prior to fracture was substantially increased. Similar effects have also been obtained with aluminum, copper, and nickel, both in the form of cold-rolled sheets and drawn rods.

This simple observation suggests that certain metals after being hardened by cold-working may regain a part of their lost ductility by further cold-work applied in the form of alternating flexure. One must not arrive to the extreme conclusion that such procedure may replace a regular annealing operation, since the improvement of ductility achieved in this way on hard tempers will be insignificant. However, in some cases it is useful to know that a metal which is just a little too hard for a specific purpose, may be made softer by this method.

Any cyclic deformation of a fixed amplitude tends to produce a predetermined degree of work-hardening irrespective of the initial state of the metal. If this work-hardening level is higher than that which existed originally, the metal will harden up until an equilibrium is reached. If the metal is originally harder, it will tend to soften under the cyclic strains. Since only a fraction of the original cold-work is reversible and can be extracted by mechanical means, the effect of "cycling" on ductility is bound to decrease when the initial degree of work hardening is high. The difference of elongation between two sheets of the same rolled 10 or 20 pct respectively is large, but that between those reduced, 50 and 60 pct is, almost nil. Hence the improvement that can be expected will be large in the first case but very small in the other.

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[2] Polakowski, N.H.: Research, 1952, 5,.
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[5] Armour, J. D.: Trans. A.S.S.T., 1940, 17, 521.

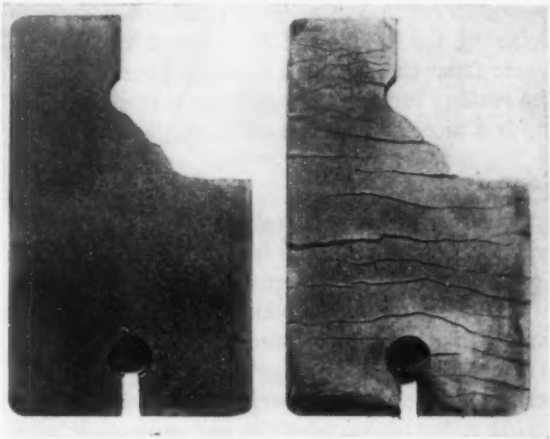
Inks Used For Crack Detection

Two new petroleum-based products of very wide application in the field of non-destructive crack and flaw detection have now been developed by the Physics Research Group of Manchester Oil Refinery Ltd., Trafford Park, Manchester, England, under the direction of Dr. R. Schnurmann.

These products are, (1), Supramor Electro-Magnetic Flaw Detection Ink for quick and reliable detection of both subcutaneous and surface flaws in ferrous metals, and Glo-Mar Fluorescent Crack Detection Ink for clear indication of surface cracks in non-ferrous alloys and plastics.

No expensive apparatus is required for the application of either of these new inks; they are extremely simple to use and quickly give a clear indication of flaws.

The method involves merely magnetising the test piece and pouring on the ink. There is not, therefore, the risk, as with the X-ray inspection method, of overlooking a flawed portion of the test piece owing to the narrow limitation of the pencil of X-rays or, as with the supersonic method, of not detecting a flaw because it is filled with oil.



GRINDING cracks on a steel plate made visible by magnetizing the plate and applying Electro-Magnetic Flaw Detection Ink. On the left the plate without the "ink" and on the right the magnetic particles of "ink" form a pattern indicating the grinding cracks.

Nonexplosive etchant—

Titanium Metallography—Simple, Safe

Titanium base materials usually range from 70 to 500 Vickers hardness with interstitial and intermetallic compounds many times harder. Since titanium is allotrophic, alpha, beta and a full range of transformation structures is involved in its metallography. While these factors complicate microscopic examination, metallographic techniques are basically similar to those used for other metals. Effective, relatively simple, inexpensive and safe procedures have been developed by Rem-Cru Titanium, Inc.

Rough polishing is done in two steps. First is a belt grind using a No. 60 grit free-cutting belt. This is followed by a hand grind using successively, a No. 180 grit 1/0, 2/0 and 3/0 emery. No. 600 grit silicon carbide is substituted for 3/0 for specimens containing carbides.

Lap-lead foil on plate glass

Rough polishing is done in two steps. A belt grind with a No. 60 grit open, free-cutting belt is used. This is followed by a hand grind using, successively, No. 180 grit, 1/0, 2/0 and 3/0 emery.

For intermediate polishing a hand polish with levigated 600-mesh silicon carbide on a lead lap should be used. The polishing suspension is prepared by placing a tablespoon of 600-mesh silicon carbide in ½ liter of water, stirring and allowing to settle 5 min. This is decanted and the decanted liquid allowed to settle 1 hr. Excess water from the decanted liquid is poured off and the residue used as the polishing suspension. The lap is a piece of lead foil on plate glass.

Soap does it

Polish by placing several soap flakes or equivalent soap powder on the lap and adding several drops of polishing suspension. Permit the soap to soften, spreading soap and suspension over the lap with the sample and removing previous scratches by back and forth strokes. Rinse excess grit from lap, redistribute soap film by applying a few drops of CCl4 and spreading with the fingers. Do not add additional abrasive but polish again to remove previous scratches.

Final polish may be obtained mechanically or electrolytically. Mechanically polish-etch using gamma alumina moistened with 1 pct HF on a revolving wheel. The wheel is protected by a film of wax on which Buehler Micro-cloth is placed. Moisten the cloth with 1 pct HF and add dry abrasive such as Linde B-5125. Polishing is done with a rotary motion and some pressure. The wheel should feel moist, not wet. Excess HF should be avoided to prevent getting it on the hands since it is quite poisonous. Objective is to polish just a little faster than the etching action. If surface is dull, etching is predominant—more dry abrasive should then be added.

Final polishing may also be done using the nonexplosive solution made up of 90 pct ethyl (or No. 30 denatured) alcohol and 10 pct n-butyl alcohol.

Into each 100 cc of alcohol dissolve 6 g anhydrous $AlCl_3$ slowly and 28 g anhydrous $ZnCl_2$. This solution is stable for about one week. Electro-polishing conditions are—30 to 60 v dc, 1 to 5 amp per sq in. of anode (the specimen) stainless steel (or other suitable) cathode, 1 to 6 min at 25° to 30°C.

Bakelite mountings used

Agitate solution. Small specimens are mounted in bakelite to facilitate handling, sample coding and storing. In this case a 1/16-in. diam hole is drilled through the bakelite onto the specimen and a copper wire is force fitted into the hole and into close contact with the specimen. This serves both to make electrical contact and to hold the specimen in the solution. Because of its non-explosive character relative to perchloric acid solutions, organic materials like bakelite can be safely placed in the bath.

A considerable number of electrolytic polishing baths have been evaluated by REM-CRU for titanium and the alcoholic chloride solution is the best found to date for a wide variety of titanium-base materials.

HF etches and HNO_3 brightens. In recognition of the pioneering contribution of Dr. W. J. Kroll to titanium and to his early use of the reagent as an etchant, we have designated the basic titanium etchant, 1-2 pct HF in water, as Kroll's Etch. It develops good structural detail without excessive relief. A 1 pct HF plus 2 pct HNO_3 solution delineates grain boundaries and cracks better than does Kroll's Etch.

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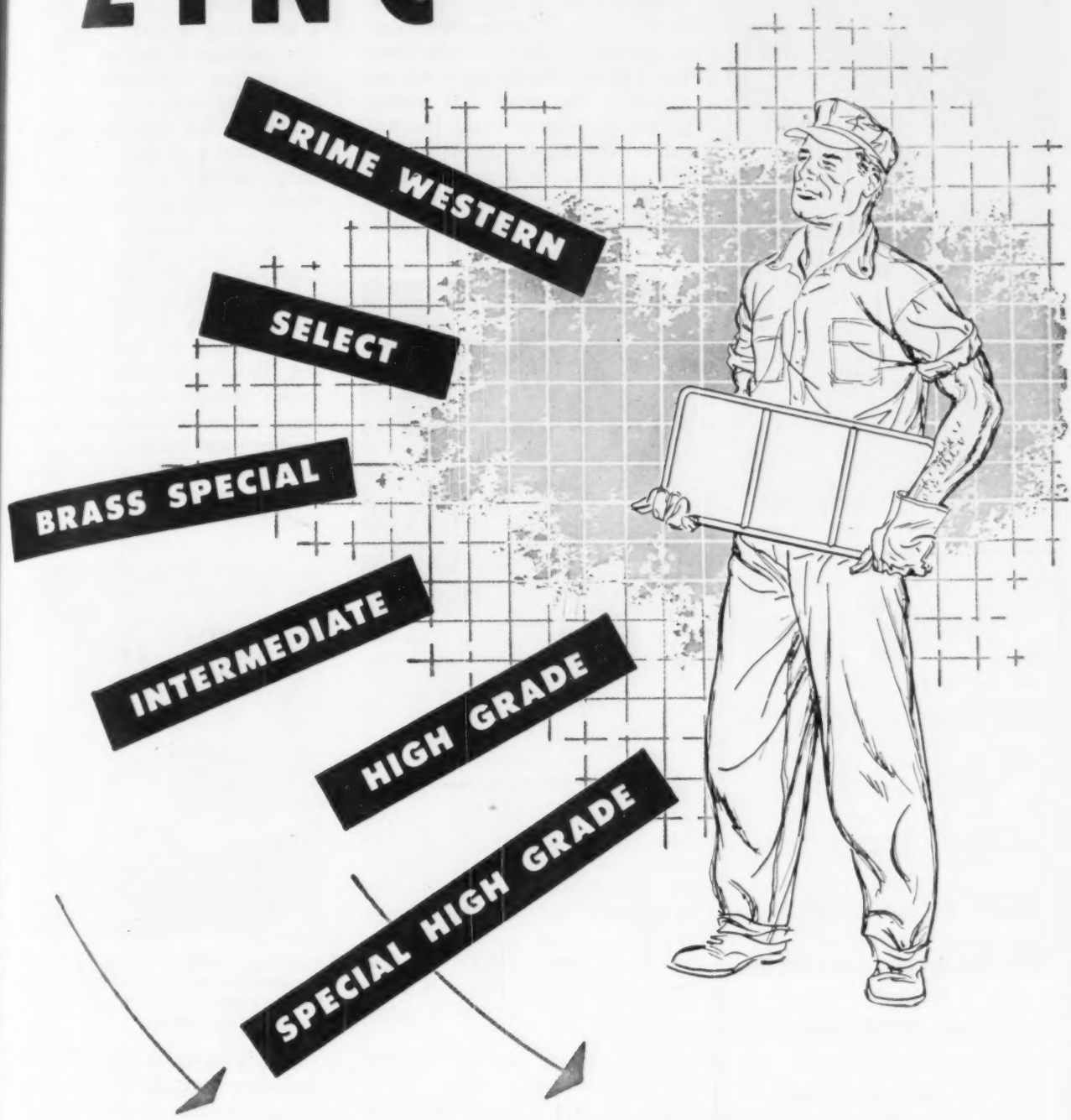

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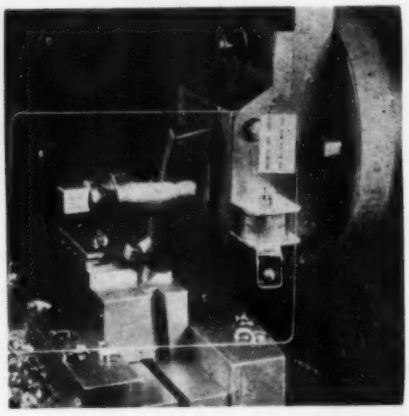
Technical Briefs

MACHINE TOOLS:

New shatter-resistant Plexiglas shield held by magnet protects operators.

An improved model of a safety guard for machine tools and other industries gains added versatility from a sheet of transparent, shatter-resistant Plexiglas ⅛-in. thick, and a powerful permanent magnet to which the plastic is swivel-mounted. Magnet holds the patented guard securely in any desired position on a machine base.

Made by the Dilley Mfg. Co., Cleveland, the Magnetic Grip Shield has been improved recently by surrounding the Alnico slug with a Plexiglas ring. This outer surface of acrylic plastic prevents chips from collecting on the magnet, as was possible when it was exposed. Also, the positioning bracket, formerly brass, is now made of the acrylic plastic in order to reduce blind spots to a minimum.



HOT, SHARP CHIPS are confined with shatter-resistant Plexiglas shield. Swivel mounted in a powerful magnet, the shield may be easily mounted to protect operators from flying chips, without obstructing view of cutting tool and work.

These shields not only protect machine operators from flying chips without obstructing their view but are used also to control splash of coolant, helping to keep the operator and his station clean. Available direct or through industrial distributors, the guard is made in sizes from 6 x 8 to 12 x 16 in. Plexiglas is a product of Rohm & Haas Co., Philadelphia.

EDUCATION:

Portable displays important part of Steel Founders education program.

Using a brand-new visual approach to technical education, Steel Founders' Society of America is preparing to carry the story of steel castings to student groups in all leading engineering schools during the 1952-53 college terms.

The Society has developed 11 new portable display panels specially designed to convey basic information on steel castings. These new panels supplant an original set of eleven which have been displayed for extended periods in more than 120 engineering schools.

Dramatizing the steel castings theme by use of color, animation and illumination, the 4 x 6-ft panels operate electrically, flashing a series of kodachrome picture combinations featuring significant steel casting applications selected to meet exacting engineering and design requirements.

PORTABLE PANELS developed by Steel Founders' Society will use Kodachrome pictures to present new ideas on steel castings to engineering students.

Once a panel is installed in its university setting, a single push-button activates the specially-built mechanism. Subsequent, successive flashes illuminate the series of kodachrome insets in sequence.

As an adjunct to the pictorial story told through the panel, the student can obtain authoritative data on steel casting products, processes and engineering details.

GUIDED MISSILES:

New drilling machine boosts production rates by cutting labor 83 pct.

Speeded guided missile production has been made possible by use of a new drilling machine which eliminates 83 pct of the labor previously required to drill holes in the leading and trailing edge of missile fins, reports Douglas Aircraft Co., Inc., Santa Monica, Calif.

The machine drills 26 holes in the leading and trailing edges of a missile in only 36 sec. Until recently, the manually performed drilling operation took 4.2 in. Main factor in the speedup is attachment of 19 Keller Airfeedrills to a jig structure.

Automatic — Selection of the proper pattern is accomplished electrically. Standard drill motors incorporating feed mechanisms were used in order to cut down tool design time, tool fabricating time and downtime for the machine when in production.

Downtime is held to a matter of minutes through use of spare motors and valves, any one of which can be changed in less than 5 min. Application of the method to other parts is expected to save much drilling time.

LADLE LIFE:

Ceramic coating protects mild steel ladles against molten Al.

Aluminum foundry engineers have doubled the life of mild steel ladles by covering the ladles with a high temperature ceramic coating. Success of this coating, developed and applied by the California Metal Enameling Co., Los Angeles, depends on the ability of ceramic coatings to withstand severe heat and thermal shock.

New Uses—Applications are being tested for zinc galvanizing tanks, molten lead, and bismuth solutions. Results indicate increased life and less "down time," with resultant production economies will be possible.

Turn to page 123

MORE Determinations per Tube

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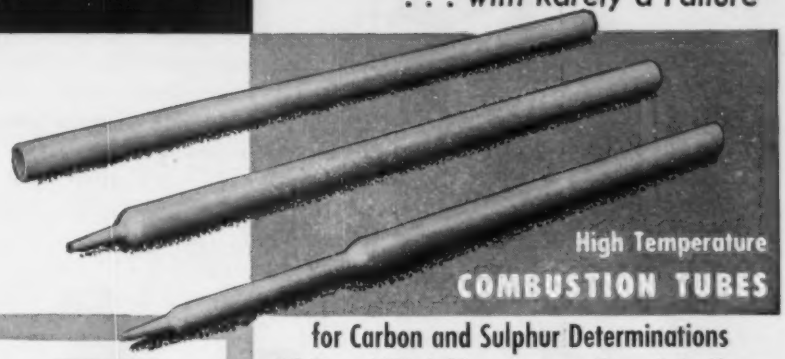

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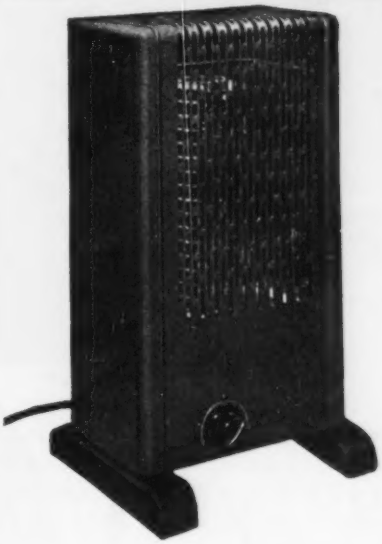

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This Wesix Electric Heater shows a typical application of Hendrick Perforated Metal, combining utility and attractiveness. The heater guard is 20 gauge steel, with 3/16" x 1½" side stagger perforations.

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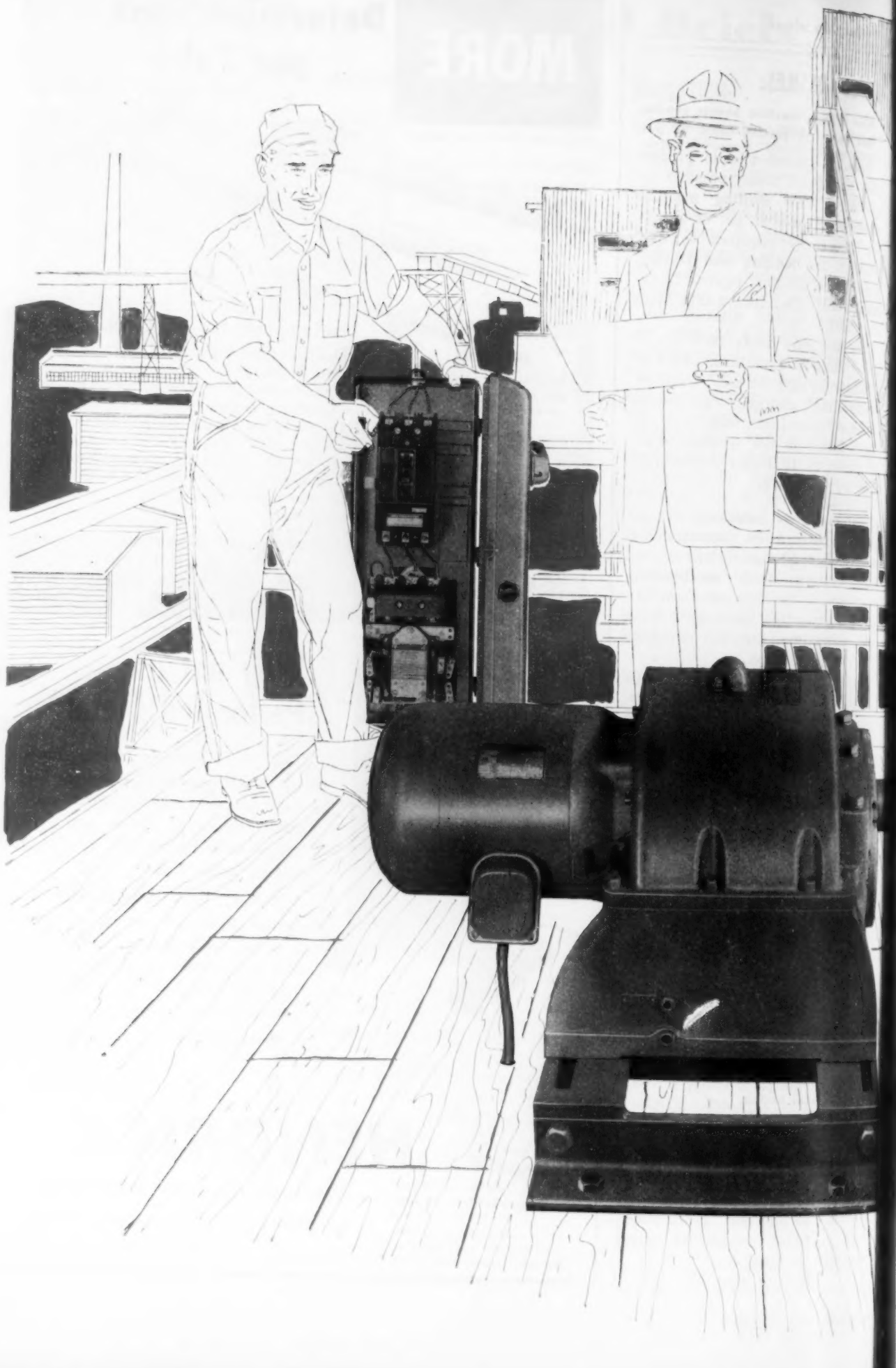

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CLAMP:

Reinforcing rods quickly locked with ring and wedge.

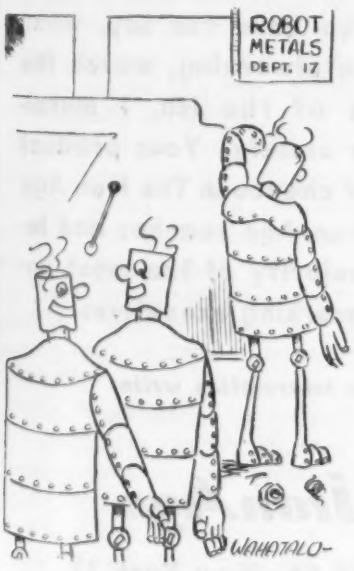
A quick, simple method of binding concrete reinforcing rods has been developed by a Cincinnati engineer. The simple device consists of two oval rings or yokes and wedges which are driven under them. Only tool required is a hammer.

Current practice requires that rods overlap as much as 48 diameters, according to J. P. Costello,

YOKE AND WEDGE clamps developed by Cincinnati engineer provide a fast, simple metal to metal connection between concrete reinforcing rods.

engineer and inventor of the clamp. Mr. Costello claims his invention will save 75 pct of this footage.

Rods are held firmly in position during pouring and tamping of concrete, protecting against possibly dangerous displacement. Rods are actually bound tighter when tension is increased, the inventor claims.



Frankly, I think he has a screw loose.

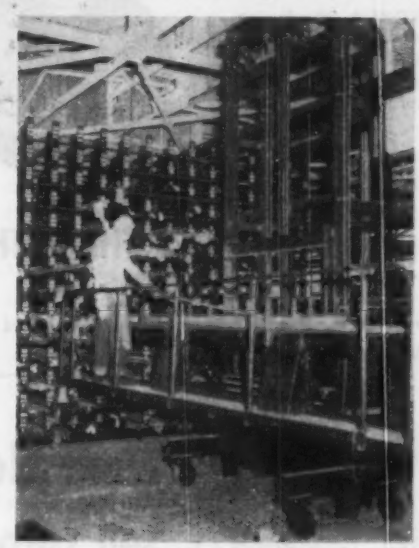
TUBE STORAGE:

Twin rack system easily handles many sizes, alloys, in small lots.

An unusual twin rack system has solved a knotty problem of storing many small quantities in a wide range of lengths, diameters and alloys of special tubing at Superior Tube Co.

The system provides short term in-process storage of tubing during drawing and reducing operations at the Norristown, Pa., tube mill.

Lattice Bin — Three basic elements are two storage racks and



BIN AND TRUCK setup used for storing small quantities of special tubing in process is shown at Norristown, Pa., plant of Superior Tube Co. Spacemaster electric lift can be operated from floor level or platform.

a mobile platform lift to move between them. Each rack is built of 3 in. channel (vertical members) and 1½ in. OD hollow stock (horizontal members) forming a lattice approximately 25 ft x 12 ft x 21 ft deep. The 300 openings in each lattice box are 12 in. square.

Racks face each other, across an open area measuring about 20 x 25 ft. In this area a materials handling truck operates.

Bundled and tagged material is pushed to a position in vertical line with a desired opening. Tubes to be stored, together with one or two operators, are lifted to the desired bin opening. Two men are sometimes required for heavier loads.

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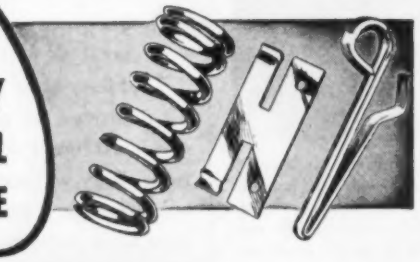
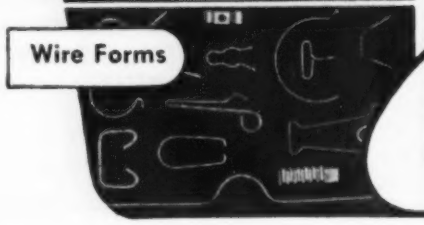
• or SHAPE





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Washington Makes The Manufacturer Its Goat

Try to force metalworkers to bear brunt of inflationary wage boosts . . . Officialdom claims price increases will be "negligible," as hard-hit manufacturers can absorb them.

An obvious pattern for passing on higher manufacturers' costs when authorized by Office of Price Stabilization's pass-through order is being hustled to the center of the stage by Washington.

By granting the higher wages that led to higher prices in steel and aluminum, Washington set up a stepladder for inflation. It is now proclaiming that no matter how many inflationary fires it has kindled by raising a manufacturer's costs, inflation will be "negligible." The manufacturer may not dare take advantage of authorized higher prices, being embroiled in sometimes fierce competition and in coddling sluggish markets.

In other words, Washington has raised a manufacturer's costs and is crowing because he can do nothing about it. The ultimate goat is the manufacturer.

Spiral Starts—But there is no doubt among many manufacturers whose products are made mostly of steel and aluminum that an inflationary spiral, however limited, is an economic necessity.

Many of these companies are engaged in competitive dueling in which low prices are a must to win business. But now higher costs have mounted to such an extent they have no alternative but to pass along these costs, or part of them, to their customers, however reluctantly.

While Washington holds aloft the unfortunate market plight of consumer durables as a prime example of why inflation may never take place, many manufacturers of light and heavy metal products are preparing to take advantage of any increases OPS may allow. A great many metalworkers are preparing for pass-throughs ranging from moderate amounts to 100 pct of higher metal costs.

Better Off? — Manufacturers who use proportionately little metal say they are in a better position to withstand the inclination to raise prices. They may hear the echoes of even a mild inflation later when it has a chance to seep through the economy.

In the category of industries unable to bear the higher-cost whipping no longer are the stampers, which THE IRON AGE surveyed to get some clue as to what may be happening in other fields. Many stampers say they can absorb no more higher costs, must pass them along in the face of competition and customer resistance. These firms admit they are on a catwalk of perilously narrow profit margins and there is no alternative but a price increase. Many are already notifying customers cost increases must be handed along.

And here they expect to meet resistance—because some of their customers are keen on holding the price line to revive buying interest. For example, a leading appliance maker told IRON AGE it was sympathetic to cost problems of stampers and screw machine products makers. But its policy of buying at the lowest price would have to stay in effect.

Parked at Doorstep—Makers of auto replacement parts are now at OPS' doorstep, asking the right to pass on 100 pct of added material costs. And their big brothers, the auto producers, will almost certainly lever up prices on 1953 models. Suppliers to auto assembly lines are sounding warnings that their prices must go up.

Active competitive factors inherent in a system of free enterprise are working against a wild inflation that Washington found politically expedient to set the stage for. Coming wage rises among several giant industries may lend more push to inflation.

Steel Market—Steel producers in the Pittsburgh area this week saw little chance for an easier market before the end of the year. Some items have softened, but only in relation to more robust demand for others. Among those easing are wire and wire products. On tonnage items the pressure is unflagging. Most-sought are bars (cold-finished and hot-rolled) and hot-rolled sheets.

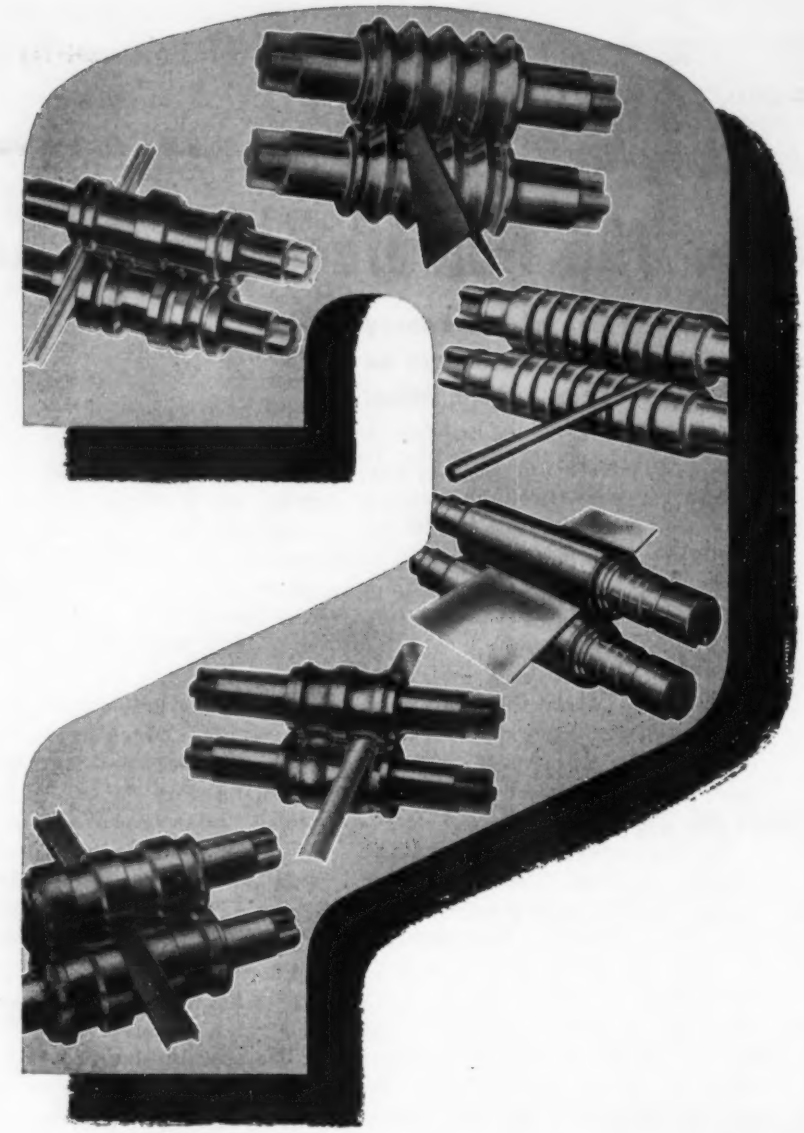
Some mills again face demands to produce plate on strip mills. This means much less operating time available for producing hot-rolled sheets and strip.

Little Trouble—Government directives have not created too much of a stir with mills yet—perhaps due to the fact that producers have been doing an exceptional job of meeting the needs of defense producers. Mills hope to head off directives and hold them to a minmum.

The alloy steel market is orderly. One producer claims he can deliver an order on the month specified. Military alloy requirements for the fourth quarter are heavy but there's some hope this demand will slacken in the first quarter next year. Some mills are nagged by poor blast furnace iron.

Steelmaking operations this week are scheduled at 99.5 pct of rated capacity, up 1 point from last week's rate.

UNIVERSITY OF MICHIGAN LIBRARIES



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Market Briefs

Retroactivity—Practically all new steel prices quoted this week in THE IRON AGE steel price tables are retroactive to July 26. In many cases, such as stainless and tool steel, producers prefer to maintain the old base and add 4.7 pct of the total base price and extras to invoices. Finished steel composite price of 4.376¢ per lb published as tentative last week is now definite and is also retroactive to July 26.

Curbs Eased—Foreign steel and used steel now may be acquired without quota restrictions. National Production Authority has eased its CMP rules (Dir. 4, CMP Reg. 1) in this regard as another step toward easing steel shortages at inventory and use levels of fabrication. "Foreign steel" is defined as steel produced outside the U. S. or Canada. "Used steel" includes steel salvaged from scrap, as well as metal left over in production or construction work.

Defense Rush—Pentagon is asking defense contractors to push for "all-out" production in weeks ahead to make up for strike losses. "Absolute minimum" inventories are being urged, so that the greatest amount of steel may be available for military production. All military orders should be clearly identfied as such at every level of production so that preferential aid may be extended quickly and easily where necessary.

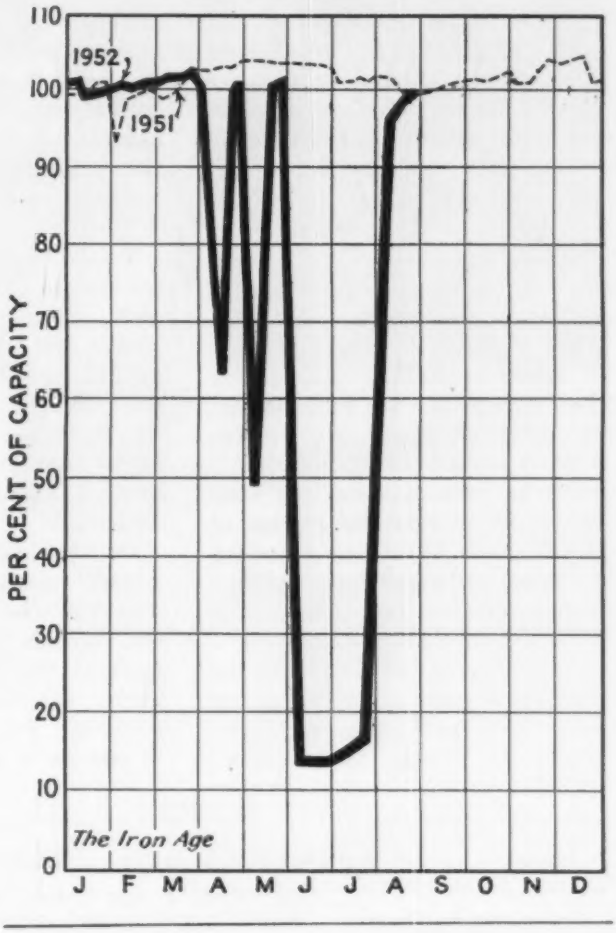
Business Better—Metal powder salesmen are looking happier every day. Demand for their products has improved steadily. One firm, which early this summer reported business off to 60 pct of last year's, now reports it is up to 70 or 75 pct of the respectable 1951 volume. Next year may be even better.

Nickel, Cobalt Substitute—Loud speaker manufacturers, plagued by shortages of cobalt and nickel, are being advised by National Production Authority to keep an eye on "Bismanol," a new material used in the production of permanent magnets that substitutes bismuth, manganese, and powdered iron for cobalt and nickel. "Bismanol" is now being developed by the U. S. Naval Ordnance Research Laboratory.

Machine Tool Fears—Downtrend in new orders in some parts of the machine tool industry is alerting producers to possible troubles ahead, machine tool manufacturers industry advisory committee told National Production Authority. Some companies are operating on backlogs alone. If more orders are not forthcoming, the committee warns, slowdowns are in prospect. Reason for decline in ordering was given as "an anticipated reduction in appropriations to the military, particularly the Navy."

More Consumer Steel?—Because allotments of steel for military projects may turn out to be excessive, there is strong possibility that manufacturers of some civilian products will soon find themselves with improved supply inventories. National Production Authority has dropped this hint to manufacturers of oil burners and added that the government is ready to render prompt assistance to manufacturers faced with shutdowns because of steel shortages. Industry says it expects a tight squeeze this fall and winter in meeting the demand for new oil burners and for replacement parts.

Steel Operations



District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	West	Buffalo	Cleveland	Detroit	Wheeling	South	Ohio River	St. Louis	East	Aggregate
Aug. 17	99.0	98.5	100.0	100.0	104.0	104.5	101.5	103.0	95.0	104.0	60.0	104.0	112.5	98.5
Aug. 24	99.0	101.0	102.0	100.0	105.0	104.5	103.0	104.5	96.0	103.0	89.0	90.0	119.0	99.5

Beginning Jan. 1, 1952, operations are based on annual capacity of 108,587,670 net tons.

Seek Minimum Aid on Taiya Plant

Alcoa asks no rapid tax write-off for hydro power plant . . . Offer metal for stockpile and independents . . . No firm contract required . . . Want equitable share—By *R. L. Hatschek.*

Biggest story of the week was Aluminum Co. of America's announcement that it is ready, willing and almost able to go ahead and start construction on its huge Alaskan aluminum project (see p. 45). Once the laws governing land purchasing in Alaska are modified, the company will start work, asking a minimum of government assistance.

The company does not ask any fast tax write-offs for the vast power generating installation. This includes a dam, tunnels, generators, turbines and anything else connected with the 1.6 million-hp hydroelectric power plant. Accelerated amortization for at least half the cost of the remaining construction is requested.

Future Stockpiling — Alcoa wants no more than its fair share of future stockpiling business for the Taiya plant. No firm contract or underwriting by the government is requested. Once Taiya is ready to produce metal the company asks an equitable portion of any business offered to American producers and an offer for an equal tonnage of aluminum that may be offered to foreign producers.

Any or all of Taiya's output for the first 5 years is offered to the government as long as such purchases are spread fairly among U. S. producers on the basis of capacity authorized since the start of hostilities in Korea.

Independents Considered—Nonintegrated producers of aluminum mill products will have 25 pct of the Alaskan project's output reserved for a 20-year period. This would be in the primary form of pig, ingot or other form suitable for further fabrication such as extrusion billet. Alcoa reserves the right to substitute metal for this purpose from other reduction plants, should that prove advantageous to the company's production scheduling. Substituted metal would be no higher in price.

Total Capacity—Plans call for two stages of 200,000 tons a year each. Thus, the completed Taiya plant would bring Alcoa's total productive capacity to about a million tons annually and the capacity of the U. S. to very near 2 million tons. This, of course, would be at least 4 years after work commenced.

On the basis of these figures, Alcoa's capacity would be a bit over half the industry total; not far enough above the halfway mark to rile the trust busters too much. But the other existing U. S. producers are certainly not going to rest on their present capacities and more new firms may yet come into the picture.

Future Outlook — The recent Paley report predicted a domestic aluminum market of possibly 3.6 million tons a year by 1975. The aluminum industry is challenging many others for markets.

Construction uses are climbing, general transportation is taking increasing quantities of the light metal, automotive people are considering aluminum for many new parts. Aluminum is young, strong and vigorous. There will be room for a huge capacity.

Tin Tangled — Office of Price Stabilization has placed tin under the provisions of Ceiling Price Reg. 31. This allows importers to tack a base period markup onto the landed cost of the commodity being sold. It's fine. It's fair. Only trouble is that the Reconstruction Finance Corp. fixed selling price of $1.21½ per lb is the real ceiling. No one will pay any higher.

After dipping sufficiently to allow some trading in the New York market, the world price has now risen to a New York equivalent higher than the RFC price. Hence, no business. Tin trade in New York has been stopped cold.

OPS, according to reports, is looking into the ceiling price problem and has high hopes of clearing the air very shortly. Trouble is that the time sense of OPS does not alway coincide with that of people in the trade.

Labor Picture Bleak—Strikes at various Connecticut Valley brass mills are building up even stronger ill will. There appears to be no common ground where labor and management can meet in some cases, particularly that of Scovill Mfg. Co., struck for nearly 10 weeks. An official of Plume & Atwood Co. said his firm is in danger of being forced out of business.

NONFERROUS METAL PRICES

	Aug. 20	Aug. 21	Aug. 22	Aug. 23	Aug. 25	Aug. 26
Copper, electro, Conn.	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake delivered	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.21⅜	$1.21⅜	$1.21½	.....	$1.21⅜	$1.21⅜*
Zinc, East St. Louis	14.00	14.00	14.00	14.00	14.00	14.00
Lead, St. Louis	15.80	15.80	15.80	15.80	15.80	15.80

Note: Quotations are going prices.
*Tentative.

5
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Economically Obtained
Hundreds of heats made with MCA Ferro-Boron have shown no fading effect in properties, from first to last ingot

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Having successfully developed and introduced the use of Boron in commercial steels (U. S. Patents 2,283,299 and 2,509,281), the Molybdenum Corporation is qualified by years of research and practical experience to advise the steel maker and to supply his needs for the most satisfactory production of Boron Steels. Advantages to be considered are:

—1— Ample Supplies, all from U.S.A.
—2— Lessened Scrap Troubles
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Offices: Pittsburgh, New York, Chicago, Cleveland, Detroit, Los Angeles, San Francisco

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Works: Washington, Pa. York, Pa.

MOLYBDENUM CORPORATION OF AMERICA
Grant Building Pittsburgh, Pa.

MCA

Nonferrous Prices

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188 in., 2S, 3S, 31.6¢; 4S, 61S-O, 33.6¢; 52S, 35.8¢; 24S-O, 24S-OAL, 34.5¢; 75S-O, 75S-OAL, 41.9¢; 0.081 in., 2S, 3S, 32.8¢; 4S, 61S-O, 35.2¢; 52S, 37.4¢; 24S-O, 24S-OAL, 35.8¢; 75S-O, 75S-OAL, 43.9; 0.032 in., 2S, 3S, 34.5¢; 4S, 61S-O, 39.0¢; 52S, 41.8¢; 24S-O, 24S-OAL, 43.8¢; 75S-O, 75S-OAL, 54.8¢.

Plate ¼ in. and Heavier: 2S-F, 3S-F, 29.7¢; 4S-F, 31.7¢; 53S-F, 33.4¢; 61S-O, 32.3¢; 24S-O, 24S-OAL, 34.0¢; 75S-O, 75S-OAL, 40.7¢.

Extruded Solid Shapes: Shape factors 1 to 5, 35.5¢ to 77.2¢; 12 to 14, 36.2¢ to 93.5¢; 24 to 26, 38.7¢ to $1.22; 36 to 38, 45.9¢ to $1.79.

Rod, Rolled: 1.064 to 4.5 in., 2S-F, 3S-F, 39.4¢ to 35.2¢; cold-finished, 0.375 to 3 in., 2S-F, 3S-F, 42.5¢ to 36.8¢.

Screw Machine Stock: Rounds, 11S-Ts, ⅛ to 11/32 in., 56.2¢ to 44.1¢; ⅜ to 1½ in., 43.6¢ to 41.0¢; 1 9/16 to 3 in., 40.4¢ to 37.8¢; 17S-Te, 1.6¢ per lb lower. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 41.5¢ to 30.5¢; 52S, 50.4 to 36.8¢; 56S, 53.6¢ to 44.1¢; 17S-T4, 56.7¢ to 39.4¢; 61S-T4, 50.9¢ to 38.9¢.

Extruded Tubing: Rounds, 63S-T5, OD in in.: 1¼ to 2, 38.9¢ to 56.7¢; 2 to 4, 35.2¢ to 47.8¢; 4 to 6, 35.7¢ to 43.6¢; 6 to 9, 36.2¢ to 45.7¢.

Roofing Sheet: Flat, 0.019 in. x 28 in., per sheet, 72 in., $1.199; 96 in., $1.598; 120 in., $1.997; 144 in., $2.398. 0.24 in. x 28 in., 72 in., $1.448; 96 in., $1.931; 120 in., $2.414; 144 in., $2.897. Coiled sheet: 0.019 in. x 28 in., 26.6¢ per lb; 0.024 in. x 28 in., 28.2 per lb.

Magnesium

(F.O.B. mill, freight allowed)

Sheet and Plate: FS1-O, ¼ in., 63¢; 3/16 in., 65¢; ⅛ in., 67¢; B & S Gage 10, 68¢; 12, 72¢. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., ¼ to 0.311 in., 74¢; ½ to ¾ in., 57.5¢; 1¼ to 1.749 in., 53¢; 2½ to 5 in., 48.5¢. Other alloys higher. Base up to ¾ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated, 0.10 to 0.11 lb, 3.5 in., 62.3¢; 0.22 to 0.25 lb, 5.9 in., 59.3¢; 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.8 to 2.59 lb, 19.5 in., 53.8¢; 4 to 6 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057; ¼ in. to 5/16, $1.40; 5/16 to ⅜, $1.26; ½ to ⅝, 93¢; 1 to 2 in., 76¢; 0.165 to 0.219, ½ to ⅝, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

Nickel and Monel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold-rolled	77	60½
Strip, cold-rolled	83	63½
Rods and bars	73	58½
Angles, hot-rolled	73	58½
Plates	75	59½
Seamless tubes	106	93½
Shot and blocks	..	53½

Copper, Brass, Bronze

(Freight prepaid on 200 lb)

	Sheet	Rods	Extruded Shapes
Copper	45.52	....	45.12
Copper, h-r	....	41.37	....
Copper, drawn	....	42.62	....
Low brass	42.34	42.03	....
Yellow brass	40.17	39.86	....
Red brass	43.10	42.79	....
Naval brass	44.72	38.78	40.04
Leaded brass	....	....	38.02
Com'l bronze	44.39	44.08	....
Mang. bronze	43.44	42.83	43.39
Phos. bronze	64.72	64.97	....
Muntz metal	42.69	38.25	39.50
Ni silver, 10 pct	51.96	54.18	....

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	20.00
Aluminum pig	19.00
Antimony, American, Laredo, Tex.	39.00
Berrylium copper, 3.75-4.25% Be	$1.56
Beryllium aluminum 5% Be, Dollars per lb contained Be	$69.50
Bismuth, ton lots	$2.35
Cadmium, del'd	$2.00
Cobalt, 97-99% (per lb)	$2.40 to $2.47
Copper, electro, Conn. Valley	24.50
Copper, Lake, delivered	24.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$200
Lead, St. Louis	15.80
Lead, New York	16.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb.	24.50
Magnesium, sticks, 100 to 500 lb.	42.00 to 44.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$186 to $189
Nickel electro, f.o.b. N. Y. warehouse	59.58
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	52.75
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$90 to $92
Silver, New York, cents per oz.	83.25
Tin, New York	$1.21⅜
Titanium, sponge	$5.00
Zinc, East St. Louis	14.00
Zinc, New York	14.83
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot	
No. 115	27.25
No. 120	26.75
No. 123	26.25
80-10-10 ingot	
No. 305	33.00
No. 315	30.50
88-10-2 ingot	
No. 210	41.50
No. 215	40.00
No. 245	34.50
Yellow ingot	
No. 405	23.25
Manganese bronze	
No. 421	30.50

Aluminum Ingot

(Cents per lb, 10,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	20.6
0.60 copper, max.	20.4
Piston alloys (No. 122 type)	20.5
No. 12 alum. (No. 2 grade)	19.5
108 alloy	20.6
195 alloy	20.8
13 alloy (0.60 copper max.)	20.8
ASX-679	20.5

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	18.80
Grade 2—92-95%	18.60
Grade 3—90-92%	18.40
Grade 4—85-90%	18.20

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	37.34
Electrodeposited	33¾
Flat rolled	38.34
Forged ball anodes	43
Brass, 80-20	
Cast, oval, 15 in. or longer	34¾
Zinc, oval	26½
Ball, anodes	25½
Nickel, 99 pct plus	
Cast	76.00
Rolled, depolarized	77.00
Cadmium	$2.15
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	97½

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	20½
Nickel chloride, 375 lb drum	27½
Silver cyanide, 100 oz lots, per oz.	67¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	47.7

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	21¼	20¾
Yellow brass	19¼	17⅞
Red brass	20¼	19⅝
Comm. bronze	20½	19¾
Mang. bronze	18½	17¾
Brass rod ends	18⅞	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
Refinery brass	17.25*
Radiators	14.75

* Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
No. 1 composition	18.50
No. 1 comp. turnings	18.25
Rolled brass	15.50
Brass pipe	16.50
Radiators	14.75

Aluminum

Mixed old cast	9 — 9¼
Mixed new clips	10 — 11
Mixed turnings, dry	9 — 9¼
Pots and pans	8½ — 9

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	18¾—19¼
No. 2 heavy copper and wire	17 —17½
Light copper	15½—16
New type shell cuttings	15½—16
Auto radiators (unsweated)	14 —14¼
No. 1 composition	17½—18
No. 1 composition turnings	17 —17½
Unlined red car boxes	16½—17
Cocks and faucets	15 —15½
Mixed heavy yellow brass	11½—12
Old rolled brass	14½—15
Brass pipe	15½—16
New soft brass clippings	16 —16½
Brass rod ends	15½—16
No. 1 brass rod turnings	15 —15½

Aluminum

Alum. pistons and struts	6 — 6½
Aluminum crankcases	7 — 7½
2S aluminum clippings	10 —10½
Old sheet and utensils	7 — 7⅝
Borings and turnings	5 — 6
Misc. cast aluminum	7 — 7½
Dural clips (24S)	7 — 7½

Zinc

New zinc clippings	5 — 5½
Old zinc	6 — 6½
Zinc routings	3½— 4¼
Old die cast scrap	4¾— 5

Nickel and Monel

Pure nickel clippings	35 —36
Clean nickel turnings	33 —34
Nickel anodes	35 —36
Nickel rod ends	35 —36
New Monel clippings	28 —29
Clean Monel turnings	30 —31
Old sheet Monel	28 —29
Nickel silver clippings, mixed	13 —14
Nickel silver turnings, mixed	12 —13

Lead

Soft scrap, lead	12½—13
Battery plates (dry)	7 — 7½
Batteries, acid free	4 — 5

Magnesium

Segregated solids	15 —16
Castings	14 —15

Miscellaneous

Block tin	100 —110
No. 1 pewter	75 —80
No. 1 auto babbitt	14½—14¾
Mixed common babbitt	19 —20
Solder joints	60
Siphon tops	19 —19½
Small foundry type	15½—16
Monotype	13½—14
Lino. and stereotype	13 —13½
Electrotype	9¾—10
Hand picked type shells	7
Lino. and stereo. dross	6½
Electro. dross	

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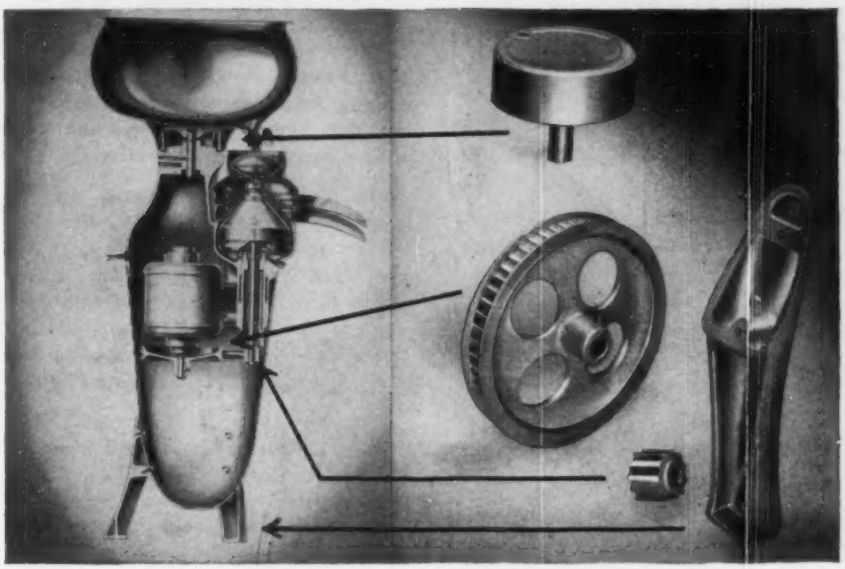
Today's competitive selling calls for advanced styling—whether the product be one for factory, farm or home. Consider the product pictured below—the latest addition to the De Laval line of cream separators. It is completely streamlined for maximum appeal to the 1952 farm family—a far cry from the separator that you remember from your boyhood farm visits.

There is more to the advanced styling of this product than meets the eye. It has been redesigned *inside* and *out* to achieve maximum quality at minimum cost and, as with countless other products, this goal has led to the use of ZINC Die Cast components. The tooth-type motor and spindle pulleys, the collar which supports the supply can and the three legs of the new centrifugal separator were designed by De Laval engineers to get the most for their ZINC Die Casting Dollar!



MINIMIZE ASSEMBLY

Each of the ZINC Die Castings pictured above is designed to reduce both machining and assembly operations. The teeth on the two pulleys are integrally cast with a high degree of dimensional accuracy for quiet, efficient operation with a corrugated belt. Only simple broaching operations are required on these pulleys and the one-piece construction minimizes assembly time—and cost. The supply can supporting casting also reduces assembly, since the steel shaft is cast as an insert.

All unnecessary metal has been eliminated in the design of these die castings. The leg casting, for example, has a massive outward appearance but, actually, it is cored in the casting operation to reduce to a minimum the amount of metal consumed. ZINC Die Castings are inherently tough and do not require excessively heavy sections to meet strength requirements.

ASK FOR DESIGN HELP

The surest way to realize the full physical and economic advantages of ZINC Die Castings is through consultation with a competent die casting engineer in the *early* design stages. Any die casting company will welcome the opportunity to be of service. Also ask that company for a copy of "Designing For Die Casting"—or write to us.

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Market Stays Steady As She Goes

Steelmaking grades move smartly in almost all areas . . . High mill inventories keep market on even keel . . . Prices stay at ceiling . . . Cast demand, prices hold fairly steady.

Scrap movement continued steady generally across the country. Steelmaking grades were moving briskly at ceiling prices in almost all areas, with the South as a notable exception. Heavy inventories in many areas meant high standards of quality, and springboards where they existed were limited.

Detroit remained an exception, with mill inventories low, and demand high. Main reason was scrap consumption during the strike by Ford and electric furnace shops in the area.

Cast grades appeared to be holding their own, with prices relatively unchanged from last week. Some dealers fear that the bottom will drop out of cast unless a very severe pig iron shortage materializes at the blast furnaces this winter.

Spot freight car shortages continue to be a nuisance in some areas, but no one seemed unduly worried. The trade generally felt the scarcity would work itself out shortly.

Many dealers believe that shipments of new steel from the mills will cure the shortage by bringing more cars into manufacturing areas. Car availability has improved in the last week in New England. In New York and other port areas slow export trade also kept freight cars away.

Pittsburgh—Market was quiet this week. Short turnings moved back to ceilings. Cast market continued firm. Mills were limiting shipments and dealers for the most part were satisfied since yard receipts were slow. Consumers are showing little interest in making new commitments as incoming scrap is about in balance with consumption and inventories already are more than ample.

Chicago—Market here is firm, but buyers are selective and not so eager as was anticipated at the end of the steel strike. Reason is the heavy inventories on hand at Chicago area mills. Prices on openhearth and steelmaking grades remain steady at ceiling, but inspection is tough and the mills demand excellent quality.

Philadelphia—The strike at one of the largest cast iron consumers in the district is over and the consumer is once again in the market—but not at ceiling prices. Prices are generally unchanged from last week. Market is strong but scrap intake is dragging its feet. Cooler weather is helping slightly.

New York—Market here continues brisk in steelmaking grades, and dealers are optimistic. Difficulty in getting freight cars is a nuisance, but doesn't seem to be serious. General feeling is that the shortage will be eased when new steel starts coming into the district, bringing more cars into the area. Cast grades continue steady, but nothing spectacular, with prices unchanged.

Detroit—The general rule that mills have highest inventories in history is not true of the Detroit area. Because Ford and electric mills operated during the strike, when no scrap was being generated by idle auto plants, most scrap was used up. Result is an aggressive demand for all grades. Resumption of auto production is reviving the flow of scrap but yards are still complaining they are not getting much. This reverses the usual situation and Detroit is temporarily a negative scrap area rather than plus.

Cleveland—Ceiling prices prevailed on practically all grades. Turnings and some items of cast scrap moved back to ceiling levels. Scrap was moving freely, although dealers report that collections have fallen off. This is partially due to shutdown of scrap-generating plants during the steel strike. Isolated instances of freight car shortages were reported.

St. Louis—A steel mill came into the market during the week for an estimated 10,000 to 12,000 tons of No. 2 heavy melting steel at the ceiling price, but with a springboard of $2 a ton. Deliveries are to be made within 30 days. Cast iron grades are in better demand as orders for finished products improve. A sale was made of unstripped motor blocks at $38, an increase of $3 a ton.

Birmingham — Movement of all grades of scrap in the South was slow this week. The largest buyer in the district of heavy melting, his storage yards running over, not only has gone out of the market temporarily, but has halted delivery of some late purchases. Brokers say very little is being shipped north because of refusal of mills to pay freight charges for long hauls while scrap is plentiful nearby, and refusal of most shippers to absorb these charges. Very little cast moved this week.

Cincinnati—Scrap was flowing freely at ceiling prices with limited springboards. It was understood that mills, with comfortable inventories, have restricted freight costs to $5 a ton. Cast market climbed back to ceiling but with springboards virtually nonexistent. Cast consumers continue to be particular about quality.

West Coast—Prices were unchanged last week and movement continued steady. Cast continued to move although a work stoppage at U. S. Pipe and Foundry somewhat reduced demand. Cast continued better in Los Angeles but remained only slightly improved in Seattle. In the Seattle area steel mills have been working on their inventory and the large accumulation of scrap in yards.

Boston — Freight car shortage, which showed up a few weeks ago in New England, has eased off a bit and is not quite so troublesome as last week. Market is fairly quiet with not too much doing. Openhearth steel is still firm at ceilings and several cast grades have moved up $1.

Buffalo — Contrary to pronounced strength in the steel scrap market was a sale of cupola cast at $2 below ceiling. Buying interest in cast is poor with prices showing a range of $2. Dealers report good clearance of yard stocks as material pours into local mills. Receipts included 12,000 tons by water.

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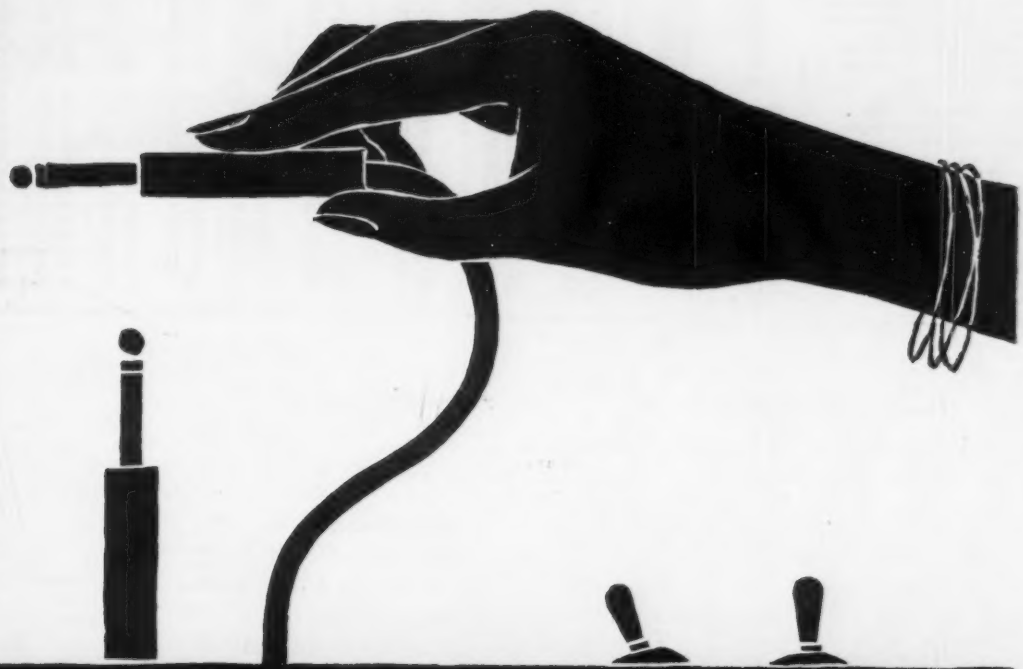

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Iron and Steel SCRAP PRICES

(Maximum basing point prices, per gross ton, as set by OPS in CPR 5 and amendments.)

GRADES	OPS No.	Pittsburgh	Johnstown	Brackenridge	Butler	Midland	Monessen	Sharon	Youngstown	Canton	Steubenville	Warren	Weirton	Cleveland	Buffalo	Cincinnati	Middletown	Chicago	Claymont	Coatesville	Conshohocken	Harrisburg	Phoenixville	Sparrows Pt.	Bethlehem	Ashland, Ky.	Kokomo, Ind.	Portsmouth, O.	St. Louis	Detroit	Duluth	Kansas City	Birmingham	Alabama City	Atlanta	Minnequa	Houston	Los Angeles	Pittsburg, Cal.	Portland, Ore.	San Francisco	Seattle
Switching Charge (Dollars per gross ton) →		$0.90	.75	.53	.65	.75	.51	.75	.75	.51	.51	.75	.70	.76	.83	.65	.26	1.34	.79	.50	.20	.20	.82	.47	.51	.51	.51		.95	.50	.76	.50	.43	.51	.33	.57	.66	.65	.33	.66	.65	.33
Basing Points →		Pittsburgh	Johnstown	Brackenridge	Butler	Midland	Monessen	Sharon	Youngstown	Canton	Steubenville	Warren	Weirton	Cleveland	Buffalo	Cincinnati	Middletown	Chicago	Claymont	Coatesville	Conshohocken	Harrisburg	Phoenixville	Sparrows Pt.	Bethlehem	Ashland, Ky.	Kokomo, Ind.	Portsmouth, O.	St. Louis	Detroit	Duluth	Kansas City	Birmingham	Alabama City	Atlanta	Minnequa	Houston	Los Angeles	Pittsburg, Cal.	Portland, Ore.	San Francisco	Seattle
No. 1 bundles	1	$44.00		$44.00					$43.00					$42.50				$42.00						$41.00				$41.15	$40.00	$39.50	$39.00			$38.00	$37.00	$38.00				
No. 1 busheling	2	44.00		44.00					43.00					42.50				42.00						41.00				41.15	40.00	39.50	39.00			38.00	37.00	38.00				
No. 1 heavy melting	3	43.00		43.00					42.00					41.50				41.00						40.00				40.15	39.00	38.50	38.00			37.00	36.00	36.00				
No. 2 heavy melting	4	43.00		43.00					42.00					41.50				41.00						40.00				40.15	39.00	38.50	38.00			37.00	36.00	36.00				
No. 2 bundles	5	43.00		43.00					42.00					41.50				41.00						40.00				40.15	39.00	38.50	38.00			37.00	36.00	36.00				
Machine shop turnings	6	34.00		34.00					33.00					32.50				32.00						31.00				31.15	30.00	29.50	29.00			28.00	27.00	25.00				
Mixed borings and turnings	7	38.00		38.00					37.00					36.50				36.00						35.00				35.15	34.00	33.50	33.00			32.00	31.00	29.00				
Shoveling turnings	8	38.00		38.00					37.00					36.50				36.00						35.00				35.15	34.00	33.50	33.00			32.00	31.00	29.00				
Cast iron borings	10	38.00		38.00					37.00					36.50				36.00						35.00				35.15	34.00	33.50	33.00			32.00	31.00	29.00				
No. 1 chemical borings	26	41.00		41.00					40.00					39.50				39.00						38.00				38.15	37.00	36.50	36.00			35.00	34.00	32.00				
Forge crops	11	51.50		51.50					50.50					50.00				49.50						48.50				48.65	47.50	47.00	46.50			45.50	44.50	42.50				
Bar crops and plate	12	49.00		49.00					48.00					47.50				47.00						46.00				46.15	45.00	44.50	44.00			43.00	42.00	40.00				
Punchings and plate	14	46.50		46.50					45.50					45.00				44.50						43.50				43.65	42.50	42.00	41.50			40.50	39.50	37.50				
Electric furnace bundles	15	46.00		46.00					45.00					44.50				44.00						43.00				43.15	42.00	41.50	41.00			40.00	39.00	37.00				
Cut const., plate, 3 ft and less	16	47.00		47.00					46.00					45.50				45.00						44.00				44.15	43.00	42.50	42.00			41.00	40.00	38.00				
Cut struc., plate, 2 ft and less	17	49.00		49.00					48.00					47.50				47.00						46.00				46.15	45.00	44.50	44.00			43.00	42.00	40.00				
Cut struc., 1 ft and less	18	50.00		50.00					49.00					48.50				48.00						47.00				47.15	46.00	45.50	45.00			44.00	43.00	41.00				
Foundry steel, 2 ft and less	20	44.00		44.00					43.00					42.50				42.00						41.00				41.15	40.00	39.50	39.00			38.00	37.00	35.00				
Foundry steel, 1 ft and less	21	46.00		46.00					45.00					44.50				44.00						43.00				43.15	42.00	41.50	41.00			40.00	39.00	37.00				
Heavy trimmings	24	43.00		43.00					42.00					41.50				41.00						40.00				40.15	39.00	38.50	38.00			37.00	36.00	34.00				
No. 1 RR heavy melting	RR 1	46.00		46.00					45.00					44.50				44.00						43.00				43.15	42.00	41.50	41.00			40.00	39.00	37.00				
Scrap rails, random lengths	RR 14	48.00		48.00					47.00					46.50				46.00						45.00				45.15	44.00	43.50	43.00			42.00	41.00	39.00				
Scrap rails, 3 ft and less	RR 16	51.00		51.00					50.00					49.50				49.00						48.00				48.15	47.00	46.50	46.00			45.00	44.00	42.00				
Scrap rails, 2 ft and less	RR 17	52.00		52.00					51.00					50.50				50.00						49.00				49.15	48.00	47.50	47.00			46.00	45.00	43.00				
Scrap rails, 18 in. and less	RR 18	54.00		54.00					53.00					52.50				52.00						51.00				51.15	50.00	49.50	49.00			48.00	47.00	45.00				
Rerolling rails	RR 15	53.00		53.00					52.00					51.50				51.00						50.00				50.15	49.00	48.50	48.00			47.00	46.00	44.00				
Uncut tires	RR 20	48.00		48.00					47.00					46.50				46.00						45.00				45.15	44.00	43.50	43.00			42.00	41.00	39.00				
Cut tires	RR 21	51.00		51.00					50.00					49.50				49.00						48.00				48.15	47.00	46.50	46.00			45.00	44.00	42.00				
Cut bolsters and side frames	RR 23	49.00		49.00					48.00					47.50				47.00						46.00				46.15	45.00	44.50	44.00			43.00	42.00	40.00				
RR specialties	RR 24, 28, 29	51.00		51.00					50.00					49.50				49.00						48.00				48.15	47.00	46.50	46.00			45.00	44.00	42.00				
Solid steel axles	RR 25	58.00		58.00					57.00					56.50				56.00						55.00				55.15	54.00	53.50	53.00			52.00	51.00	49.00				
No. 3 steel wheels	RR 27	51.00		51.00					50.00					49.50				49.00						48.00				48.15	47.00	46.50	46.00			45.00	44.00	42.00				
Unassorted	RR 35	40.00		40.00					39.00					38.50				38.00						37.00				37.15	36.00	35.50	35.00			34.00	33.00	31.00				

Cast Scrap Ceilings

Prices set by CPR 5, OPS

(F.o.b. all shipping points)

Grades	OPS No.	
Cupola cast	1	$49.00
Charging box cast	2	47.00
Heavy breakable cast	3	45.00
Cast iron brake shoes	5	41.00
Stove plate	6	46.00
Clean auto cast	7	52.00
Unstripped motor blocks	8	43.00
Cast iron carwheels	9	47.00
Malleable	10	55.00
Drop broken mach'y cast	11	52.00

Ceiling price of clean cast iron foundry runout or prepared cupola drops is 75 pct of corresponding grade.

Under Ceiling Scrap Prices

Pittsburgh

Machine shop turn.	$32.00
Mixed bor. and ms. turns.	32.00
Cast iron borings	$35.00 to 35.50
No. 1 machinery cast	52.00
Heavy breakable cast	45.00
Malleable	55.00

Chicago

Low phos. forge crops	$50.00 to $51.00
Low phos. 3 ft and under	44.00 to 45.00
No. 1 machinery cast	47.50 to 48.50
Cupola cast	45.00 to 46.00
Heavy breakable cast	40.50 to 41.50
Malleable	53.00 to 45.00
Stove plate	42.00 to 43.00

Philadelphia Area

Clean cast chem. borings	$36.50 to $37.00
Cupola cast	45.00 to 47.00
Heavy breakable cast	44.00 to 45.00
Unstripped motor blocks	41.00 to 42.00
Charging box cast	44.00 to 45.00

Cleveland

Cast iron borings	$34.00 to $34.50
Stove plate	45.00 to 46.00
Malleable	54.00 to 55.00

Youngstown

Cast iron borings	$35.00 to $35.50

Buffalo

No. 1 machinery cast	$49.00 to $51.00
No. 1 cupola cast	47.00 to 49.00

Birmingham

Shoveling turnings	$29.00 to $31.00
Cast iron borings	29.00 to 31.00
No. 1 cupola cast	44.00 to 45.00
Stove plate	40.00 to 41.00
Charging box cast	39.00 to 40.00
Heavy breakable	37.00 to 38.00
Drop broken machinery	44.00 to 45.00
Unstripped motor blocks	37.00 to 38.00

St. Louis

Unstripped motor blocks	$38.00

New York

Brokers' Buying prices per gross ton, on cars:

Clean cast chem. borings	$30.00 to $30.50
No. 1 machinery cast	49.00 to 50.00
Mixed yard cast	43.00 to 44.00
Charging box cast	42.00 to 43.00
Heavy breakable cast	41.00 to 42.00
Unstripped motor blocks	37.00 to 38.00

Boston

Brokers' Buying prices per gross ton, on cars:

Mixed cupola cast	$39.00 to $40.00
Heavy breakable cast	39.00 to 40.00
Stove plate	37.00 to 38.00

Detroit

Brokers' Buying prices per gross ton, on cars:

No. 1 cupola cast	$48.00
Heavy breakable cast	$43.00 to 44.00
Stove plate	43.00 to 44.00
Cast iron brake shoes	39.00 to 40.00

Cincinnati

Drop broken cast	51.00 to 52.00

San Francisco

No. 2 bundles	$29.00
Machine shop turn	20.00
No. 1 cupola cast	46.00

Los Angeles

No. 2 bundles	$29.00
Mach. shop turn	20.00
No. 1 cupola cast	50.00

Seattle

No. 2 bundles	$29.00
No. 1 cupola cast	40.50
Heavy breakable	35.50

Hamilton, Ont.

No. 1 hvy. belting	$35.00
No. 1 bundles	35.00
No. 2 bundles	34.50
Mechanical bundles	33.00
Mixed steel scrap	31.00
Mixed bor. and turn.	32.00
Rails, remelting	35.00
Rails, rerolling	33.00
Bushelings	30.00
Bush. new fact. prep'd.	33.00
Bush., new fact. unprep'd	32.00
Short steel turnings	32.00
Cast scrap	50.00

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	Aug 26, 1952	Aug. 19*, 1952	July 29*, 1952	Aug. 28, 1951
Hot-rolled sheets	3.775	3.775	3.775	3.60
Cold-rolled sheets	4.575	4.575	4.575	4.35
Galvanized sheets (10 ga)	5.075	5.075	5.075	4.80
Hot-rolled strip	3.725	3.725	3.725	3.50
Cold-rolled strip	5.20	5.20	5.20	4.75
Plate	3.90	3.90	3.90	3.70
Plates wrought iron	9.00	9.00	9.00	7.85
Stains C-R strip (No. 302)	36.75†	36.75†	36.75†	36.75
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb.) cokes	$8.95	$8.95	$8.95	$8.70
Tinplate, electro (0.50 lb.)	7.65	7.65	7.65	7.40
Special coated mfg. ternes	7.75	7.75	7.75	7.50
Bars and Shapes: (cents per pound)				
Merchant bars	3.95	3.95	3.95	3.70
Cold finished bars	4.925	4.925	4.925	4.55
Alloy bars	4.675	4.675	4.675	4.30
Structural shapes	3.85	3.85	3.85	3.65
Stainless bars (No.302)	31.50†	31.50†	31.50†	31.50
Wrought iron bars	10.05	10.05	10.05	9.50
Wire (cents per pound)				
Bright wire	5.225	5.225	5.225	4.85
Rails (dollars per 100 lb)				
Heavy rails	$3.775	$3.775	$3.775	$3.60
Light rails	4.25	4.25	4.25	4.00
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$59.00	$59.00	$59.00	$56.00
Slabs rerolling	59.00	59.00	59.00	56.00
Forging billets	70.50	70.50	70.50	66.00
Alloy blooms, billets, slabs	76.00	76.00	76.00	70.00
Wire Rod and Skelp: (cents per pound)				
Wire rods	4.325	4.325	4.325	4.10
Skelp	3.55	3.55	3.55	3.35

* Revised † Add 4.7 pct.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Pig Iron: (per gross ton)	Aug. 26, 1952	Aug. 19, 1952	July 29, 1952	Aug. 28, 1951
Foundry, del'd Phila.	$58.19	$58.19	$58.19	$57.77
Foundry, Valley	52.50	52.50	52.50	52.50
Foundry, Southern, Cin'ti	55.58	55.58	55.58	55.58
Foundry, Birmingham	48.88	48.88	48.88	48.88
Foundry, Chicago†	52.50	52.50	52.50	52.50
Basic, del'd Philadelphia	57.27	57.27	57.27	56.92
Basic, Valley furnace	52.00	52.00	52.00	52.00
Malleable, Chicago†	52.50	52.50	52.50	52.50
Malleable, Valley	52.50	52.50	52.50	52.50
Charcoal, Chicago	70.56	70.56	70.56	70.56
Ferromanganese‡	226.25	226.25	186.25	186.25

†The switching charges for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy pages.

Scrap: (per gross ton)	Aug. 26, 1952	Aug. 19, 1952	July 29, 1952	Aug. 28, 1951
No. 1 steel, Pittsburgh	$43.00*	$43.00*	$43.00*	$44.00*
No. 1 steel, Phila. area	41.50*	41.50*	40.75	42.50*
No. 1 steel, Chicago	41.50*	41.50*	41.50*	42.50*
No. 1 bundles, Detroit	41.15*	41.15*	41.15*	41.15*
Low phos. Young'n	46.50*	46.50*	46.50*	46.50*
No. 1 cast, Pittsburgh	49.00†	49.00†	46.25	49.00†
No. 1 cast, Philadelphia	46.00	46.00	41.50	49.00†
No. 1 cast Chicago	45.50	45.50	42.50	49.00†

*Basing pt., not including broker's fee.
†Shipping pt., not including broker's fee.

Coke: Connellsville: (per net ton at oven)	Aug. 26, 1952	Aug. 19, 1952	July 29, 1952	Aug. 28, 1951
Furnace coke, prompt	$14.75	$14.75	$14.75	$14.75
Foundry coke, prompt	17.75	17.75	17.75	17.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	24.50	24.50	24.50	24.50
Copper, Lake, Conn.	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.21⅜	$1.21⅜	*$1.21½	$1.03
Zinc, East St. Louis	14.00	14.00	15.00	17.50
Lead, St. Louis	15.80	15.80	15.80	16.80
Aluminum, virgin	20.00	20.00	19.00	19.00
Nickel, electrolytic	59.58	59.58	59.58	59.58
Magnesium, ingot	24.50	24.50	24.50	24.50
Antimony, Laredo, Tex.	39.00	39.00	39.00	42.00

* Revised

Composite Prices

[Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)]

Finished Steel Base Price

Aug. 26, 1952	4.376¢ per lb
One week ago	4.376¢ per lb*
One month ago	4.376¢ per lb*
One year ago	4.131¢ per lb

	High		Low	
1952	4.376¢	July 29	4.131¢	Jan. 1
1951	4.131¢	Jan. 2	4.131¢	Jan. 2
1950	4.131¢	Dec. 1	3.837¢	Jan. 3
1949	3.837¢	Dec. 27	3.705¢	May 3
1948	3.721¢	July 27	3.193¢	Jan. 1
1947	3.193¢	July 29	2.848¢	Jan. 1
1946	2.848¢	Dec. 31	2.464¢	Jan. 1
1945	2.464¢	May 29	2.396¢	Jan. 1
1944	2.396¢		2.396¢	
1943	2.396¢		2.396¢	
1942	2.396¢		2.396¢	
1941	2.396¢		2.396¢	
1940	2.30467¢	Jan. 2	2.24107¢	Apr. 16
1939	2.35367¢	Jan. 3	2.27207¢	May 16
1938	2.58414¢	Jan. 4	2.27207¢	Oct. 18
1937	2.58414¢	Mar. 9	2.32263¢	Jan. 4
1936	2.32263¢	Dec. 28	2.05200¢	Mar. 10

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

* Revised

Pig Iron

	$52.77 per gross ton
One week ago	52.77 per gross ton
One month ago	52.77 per gross ton
One year ago	52.69 per gross ton

	High		Low	
	$52.77	May 2	$52.72	Jan. 1
	52.72	Oct. 9	52.69	Jan. 2
	52.69	Dec. 12	45.88	Jan. 3
	46.87	Jan. 18	45.88	Sept. 6
	46.91	Oct. 12	39.58	Jan. 6
	37.98	Dec. 30	30.14	Jan. 7
	30.14	Dec. 10	25.37	Jan. 1
	25.37	Oct. 23	23.61	Jan. 2
	$23.61		$23.61	
	23.61		23.61	
	23.61		23.61	
	$23.61	Mar. 20	$23.45	Jan. 2
	23.45	Dec. 23	22.61	Jan. 2
	22.61	Sept. 19	20.61	Sept. 12
	23.25	June 21	19.61	July 6
	32.25	Mar. 9	20.25	Feb. 16
	19.74	Nov. 24	18.73	Aug. 11

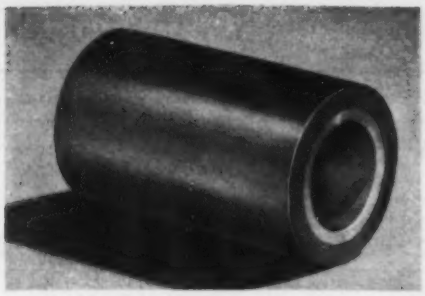
Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Scrap Steel

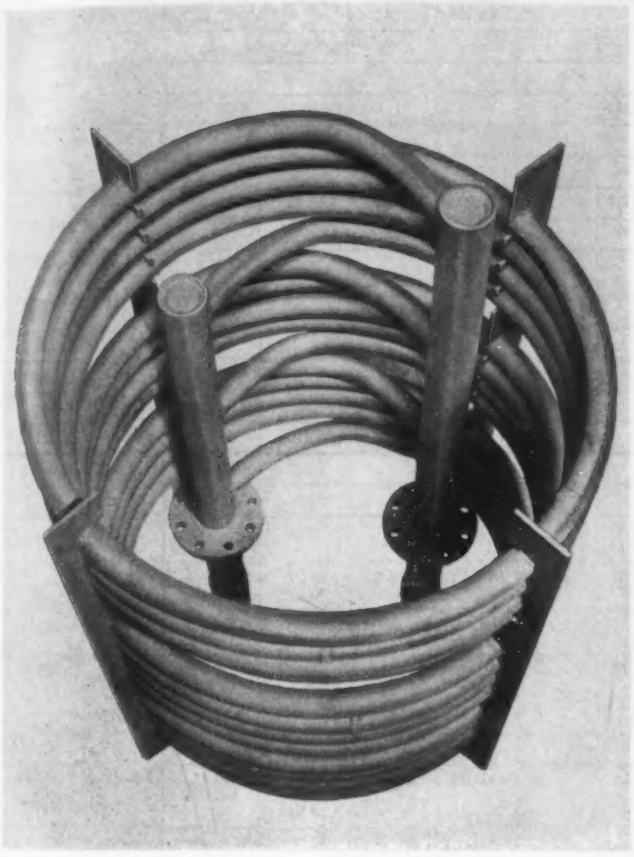
	$42.00 per gross ton
One week ago	42.00 per gross ton
One month ago	41.75 per gross ton
One year ago	43.00 per gross ton

	High		Low	
	$42.00	Jan. 1	$39.17	July 1
	47.75	Jan. 30	42.00	Oct. 23
	45.13	Dec. 19	26.25	Jan. 3
	43.00	Jan. 4	19.33	June 28
	43.16	July 27	39.75	Mar. 9
	42.58	Oct. 28	29.50	May 20
	31.17	Dec. 24	19.17	Jan. 1
	19.17	Jan. 2	18.92	May 22
	19.17	Jan. 11	15.76	Oct. 24
	$19.17		$19.17	
	19.17		19.17	
	$22.00	Jan. 7	$18.92	May 22
	21.83	Dec. 30	16.04	Apr. 9
	22.50	Oct. 3	14.08	May 16
	15.00	Nov. 22	11.00	June 7
	21.92	Mar. 30	12.67	June 9
	17.75	Dec. 21	12.67	June 8

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.



• Cross section of Duplex Tubing, lead outside, copper inside.
Courtesy: The Bridgeport Brass Co., Bridgeport, Conn.



• Lead-copper Duplex Tubing cooling and heating coil.
Courtesy: The Patterson-Kelley Co., Inc., East Stroudsberg, Pa.

• A job for CHEMICAL LEAD and *the* CHEMICAL LEAD for the job!

It would be difficult to think of any product in modern life which — somewhere along the line of manufacture — has not been in contact with sulfuric acid. Indeed, the volume of H_2SO_4 produced annually is sometimes called a standard for measuring the "civilization" of a nation. In the United States alone, nearly eleven million tons of 100% sulfuric acid have been produced and consumed in a single year.

Lead is a virtually indispensable material of construction in our vast chemical industries. For lead has the unique property of forming automatically upon its surface a protective coating of insoluble and tightly adherent lead salts which makes the metal practically immune to the attack of H_2SO_4. In addition to its unmatched durability, versatile lead — with its low melting point, softness, pliability — is easy to fabricate. Rolled in sheets, lead is readily formed into linings for tanks and all manner of vessels for the handling of acids. Extruded in tubular form, or cast in molds or dies, lead makes pipe, coils and innumerable other items for use with corrosive liquids.

Lead's durability is frequently utilized in combination with other metals when product-application calls for properties not inherent in lead — such as strength for instance. The steam heating and cooling coil shown above is a typical example. While coils for immersion in sulfuric acid solutions are generally made of lead, operating conditions, such as extreme heat and pressure, sometimes make it necessary to use two metals for the tubing — in this case, lead outside for its corrosion resistance and copper inside to provide higher strength.

St. Joe Chemical Lead — an exclusive product of the huge ore bodies of Southeast Missouri which have been owned and operated by this Company since 1865 — has been and is now, the most extensively used brand of lead in the chemical industries, and hundreds of thousands of tons are now in use. Last but by no means least, when the life of the equipment is spent, the metal is easily reclaimed and, due to the imperishable nature of lead, is returned to the market for another cycle of long and useful service.

ST. JOSEPH LEAD COMPANY
250 PARK AVENUE *ELdorado 5-3200* NEW YORK 17
THE LARGEST PRODUCER OF LEAD IN THE UNITED STATES

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill in cents per lb., unless otherwise noted. Extras apply.

		INGOTS		BILLETS, BLOOMS, SLABS			PIPE SKELP	PIL-ING	SHAPES STRUCTURALS		STRIP			
		Carbon Forging Net Ton	Alloy Net Ton	Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Sheet Steel	Carbon	Hi Str. Low Alloy	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy
EAST	Bethlehem Pa.					76.00 *B3*			3.90 *B3*	5.80 *B3*				
	Buffalo, N. Y.			59.00 *B3*	70.50 *B3, R3*	76.00 *B3, R3*		4.675 *B3*	3.90 *B3*	5.80 *B3*	3.725 *B3, R3*	5.10 *B3*	5.70 *B3*	7.90 *B3*
	Claymont Del.													
	Coatesville Pa.													
	Conshohocken Pa.				77.50 *A2*	83.00 *A2*					4.125 *A2*		5.90 *A2*	
	Harrisburg Pa.													
	Hartford Conn.													
	Johnstown Pa.			59.00 *B3*	70.50 *B3*	76.00 *B3*			3.90 *B3*	5.80 *B3*	3.725 *B3*			
	Newark N. J.													
	New Haven Conn.											5.60 *A5* 5.85 *D1*		
	Phoenixville Pa.								6.10 *P2*					
	Putnam Conn.													
	Sparrows Pt. Md.										3.725 *B3*	5.10 *B3*	5.70 *B3*	7.90 *B3*
	Worcester Mass.													
	Trenton N. J.											6.45 *R4*		
MIDDLE WEST	Alton, Ill.										4.20 *L1*			
	Ashland, Ky.										3.725 *A7*			
	Canton-Massillon, Ohio				70.50 *R3*	76.00 *R3* 78.60 *T5*								
	Chicago, Ill.			59.00 *U1*	70.50 *U1, R3, W8*	76.00 *U1, R3, W8*		4.675 *U1*	3.85 *U1, W8*	5.80 *U1*	3.725 *W8* 3.725 *A1*	5.35 *A1*		
	Cleveland, Ohio				70.50 *R3*							5.10 *A5, J3*		7.45 *J3*
	Detroit, Mich.	56.00 *R5*	57.00 *R5*		73.50 *R5*	79.00 *R5*					4.025 *G3* 4.40 *M2*	5.30 *G3* 5.45 *M2* 5.60 *D1* 6.05 *D2*	6.30 *G3*	8.15 *G3*
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana			59.00 *U1*	70.50 *U1*	76.00 *U1, Y1*		4.675 *I3*	3.85 *I3, U1*	5.80 *I3, U1* 6.30 *Y1*	3.725 *I3, U1, Y1*	5.35 *I3*	5.65 *I3, U1* 6.15 *Y1*	
	Granite City, Ill.													
	Kokomo, Ind.													
	Middletown, Ohio											5.10 *A7*		
	Niles, Ohio Sharon, Pa.										4.225 *S1*	5.80 *S1*	5.65 *S1*	7.30 *S1*
	Pittsburgh, Pa.	54.00 *U1*	57.00 *U1*	59.00 *U1, J3*	70.50 *U1, J3*	76.00 *U1*	3.55 *U1* 3.65 *J3*	4.675 *U1*	3.85 *U1, J3*	5.80 *U1, J3*	3.725 *J3, A7* 4.225 *S7*	5.10 *J3, A7* 5.80 *B4, S7*		
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.													
	Youngstown, Ohio					76.00 *Y1, C10*	3.55 *U1, R3*			6.30 *Y1*	3.725 *U1, Y1, R3*	5.10 *R3, Y1* 5.70 *C3* 5.80 *B4*	5.65 *R3, U1* 6.15 *Y1*	7.30 *R3* 7.80 *Y1*
WEST	Fontana, Cal.	81.00 *K1*	83.00 *K1*	78.00 *K1*	89.50 *K1*	95.00 *K1*			4.45 *K1*	6.40 *K1*	4.975 *K1*	6.75 *K1*	6.55 *K1*	
	Geneva, Utah				70.50 *C7*				3.85 *C7*	5.80 *C7*				
	Kansas City, Mo.								4.45 *S2*		4.325 *S2*			
	Los Angeles, Torrance, Cal.				89.50 *B2*	96.00 *B2*			4.45 *C7, B2*	6.35 *B2*	4.475 *C7, B2*		6.40 *B2*	
	Minnequa, Colo.													
	San Francisco, Niles, Pittsburg, Cal.				89.50 *B2*				4.40 *B2* 4.56 *P9*	6.30 *B2*	4.475 *C7, B2*		6.40 *B2*	
	Seattle, Wash.				89.50 *B2*				4.50 *B2*	6.40 *B2*	4.725 *B2*		6.65 *B2*	
SOUTH	Atlanta, Ga.										4.275 *A8*			
	Birmingham, Ala. Alabama City, Ala.			59.00 *T2*	70.50 *T2*				3.85 *T2, R3*	5.80 *T2*	3.725 *T2, R3*			
	Houston, Texas		65.00 *S2*		78.50 *S2*	84.00 *S2*			4.25 *S2*		4.125 *S2*			

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE	
Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized 10 ga.	Enameling 12 ga.	Long Terne 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Hollowware Enameling 29 ga.	
													Bethlehem, Pa.
3.775 *B3*	4.575 *B3*				5.675 *B3*	6.925 *B3*							Buffalo, N. Y.
										† Special coated mfg ternes deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb, deduct $2.20 from 1.25-lb coke base box. * COKES: 1.50-lb, add 25¢. ELECTRO: 0.50-lb add 25¢; 0.75-lb, add 65¢.			Claymont, Del.
													Coatesville, Pa.
3.175 *A2*					5.925 *A2*								Conshohocken, Pa.
													Harrisburg, Pa.
													Hartford, Conn.
									4.325 *B3*				Johnstown, Pa.
													Newark, N. J.
													New Haven, Conn.
													Phoenixville, Pa.
													Putnam, Conn.
3.775 *B3*	4.575 *B3*	5.075 *B3*			5.675 *B3*	6.925 *B3*	7.775 *B3*		4.425 *B3*	$8.80 *B3*	$7.50 *B3*		Sparrows Pt., Md.
									4.625 *A5*				Worcester, Mass.
									4.425 *R4*				Trenton, N. J.
									4.70 *L1*				Alton, Ill.
3.775 *A7*		5.075 *A7*	4.925 *A7*										Ashland, Ky.
		5.075 *R3*											Canton-Massillon, Ohio
3.775 *W8*					5.675 *U1*				4.325 *A5, R3*				Chicago, Ill.
3.775 *R3, J3*	4.575 *R3, J3*		4.925 *R3*		5.675 *R3, J3*	6.925 *R3, J3*			4.325 *A5*				Cleveland, Ohio
3.975 *G3*	4.775 *G3*				6.225 *G3*	7.475 *G3*							Detroit, Mich.
													Duluth, Minn.
3.775 *I3, U1, Y1*	4.575 *I3, U1, Y1*	5.075 *I3, U1*	4.925 *U1*	5.475 *U1*	5.675 *I3, U1* 6.175 *Y1*	6.925 *I3, U1* 7.425 *Y1*			4.325 *Y1*	$8.70 *U1, I3, Y1*	$7.40 *U1, I3*	6.10 *U1, Y1*	Gary, Ind. Harbor, Indiana
4.30 *G2*	5.275 *G2*	5.50 *G2*	5.625 *G2*								$7.60 *G2*	6.30 *G2*	Granite City, Ill.
													Kokomo, Ind.
	4.575 *A7*		4.925 *A7*	5.475 *A7*									Middletown, Ohio
4.175 *S1*					5.675 *S1*								Niles, Ohio Sharon, Pa.
3.775 *U1, J3, A7*	4.575 *U1, J3, A7*	5.075 *U1*	4.925 *U1*		5.675 *U1, J3*	6.925 *U1, J3*	7.625 *U1*		4.325 *A5*	$8.70 *U1, J3*	$7.40 *U1, J3*	6.10 *U1*	Pittsburgh, Pa.
									4.52 *P7*				Portsmouth, Ohio
3.775 *WS*		5.075 *WS*		5.475 *WS*						$8.70 *WS*	$7.40 *WS*	6.35 *WS*	Weirton, Wheeling, Follansbee, W. Va.
3.775 *U1, R3, Y1*	4.575 *R3, Y1*	5.775 *R1*	4.925 *Y1*		5.675 *U1* 6.175 *Y1*	7.425 *Y1*		5.825 *R1*	4.325 *Y1*	$8.70 *R3*	$7.40 *R3*		Youngstown, Ohio
4.725 *K1*	5.525 *K1*				6.625 *K1*	7.875 *K1*			5.125 *K1*				Fontana, Cal.
3.875 *C7*													Geneva, Utah
													Kansas City, Mo.
4.475 *C7*		5.825 *C7*						5.575 *C7*	5.125 *C7, B2*				Los Angeles, Torrance, Cal.
													Minnequa, Colo.
4.475 *C7*	5.525 *C7*	5.825 *C7*							4.975 *C7*	$9.45 *C7*	$8.15 *C7*		San Francisco, Niles, Pittsburg, Cal.
													Seattle, Wash.
													Atlanta, Ga.
3.775 *T2, R3*	4.575 *T2*	5.075 *T2, R3*			5.675 *T2*			4.925 *R3*	4.325 *T2, R3*	$8.80 *T2*	$7.50 *T2*		Birmingham, Ala. Alabama City, Ala.
									4.725 *S2*				Houston, Tex.

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IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. **Base prices, f.o.b. mill, in cents per lb., unless otherwise noted.** Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfg'r's Bright
EAST	Bethlehem, Pa.				4.675 *B3*	6.00 *B3*	5.925 *B3*					
	Buffalo, N. Y.	3.95 *B3,R3*	3.95 *B3,R3*	4.975 *B5*	4.65 *R3* 4.675 *B3*	6.00 *B3,B5*	5.925 *B3*	3.90 *B3*			5.95 *B3*	
	Claymont, Del.							4.35 *C4*		5.35 *C4*		
	Coatesville, Pa.							4.35 *L4*			5.75 *L4*	
	Conshohocken, Pa.							4.35 *A2*	4.95 *A2*		6.20 *A2*	
	Harrisburg, Pa.							6.50 *C3*	6.50 *C3*			
	Hartford, Conn.			5.475 *R3*		6.45 *R3*						
	Johnstown, Pa.	3.95 *B3*	3.95 *B3*		4.675 *B3*		5.925 *B3*	3.90 *B3*		5.25 *B3*	5.95 *B3*	5.225 *B3*
	Newark, N. J.			5.375 *W10*		6.35 *W10*						
	New Haven, Conn.											
	Phoenixville, Pa.											
	Putnam, Conn.			5.475 *W10*								
	Sparrows Point, Md.		3.95 *B3*					3.90 *B3*		5.25 *B3*	5.95 *B3*	5.325 *B3*
	Worcester, Mass.					6.35 *A5*						5.525 *A5*
	Trenton, N. J.											
MIDDLE WEST	Alton, Ill.	4.50 *L1*										5.45 *L1*
	Ashland, Ky.							3.90 *A7*				
	Canton-Massillon	3.95 *R3*		4.925 *R2,R3*	4.65 *R3* 4.72 *T5*	5.99 *T5* 6.00 *R2,R3*						
	Chicago, Ill.	3.95 *U,W8, R3*	3.95 *R3*	4.925 *A5,B5 W8,W10*	4.675 *U1,W8* 4.65 *R3*	6.00 *B5,W8 W10,R3* 6.05 *A5* 6.00 *L2*		3.90 *U1,W8*	4.95 *U1*	5.25 *U1*	5.95 *U1*	5.225 *A5,R3* 5.225 *N4* 5.325 *K2*
	Cleveland, Ohio	3.95 *R3*	3.95 *R3*	4.925 *A5,C13*		6.00 *C13* 6.05 *A5*	5.925 *R3*	3.90 *R3,J3*	4.95 *J3*		5.95 *R3,J3*	5.225 *A5, C13*
	Detroit, Mich.	4.10 *R5* 4.30 *G3*		5.075 *R5,P8* 5.175 *P3*	4.825 *R5* 5.025 *G3*	6.15 *R5,P8* 6.20 *P3*	6.675 *G3*	4.45 *G3*			6.90 *G3*	
	Duluth, Minn.											5.225 *A5*
	Gary Ind. Harbor, Indiana	3.95 *I3, U1, Y1*	3.95 *I3, U1, Y1*	4.925 *R3* 4.925 *L2,M5*	4.675 *I3, U1, Y1*	6.00 *R5* 6.00 *L2,M5*	5.925 *I3, U1* 6.425 *Y1*	3.90 *I3, U1, Y1*	4.95 *I3*	5.25 *U1*	5.95 *I3, U1* 6.45 *Y1*	5.325 *M4*
	Granite City, Ill.							4.60 *G2*				
	Kokomo, Ind.											
	Middletown, Ohio											
	Niles, Ohio Sharon, Pa.							4.15 *S1*		5.70 *S1*	5.95 *S1*	
	Pittsburgh, Pa.	3.95 *U1, J3*	3.95 *U1, J3*	4.925 *A5, J3, W10, R3*	4.675 *U1, J3*	6.00 *W10* 6.05 *A5*	5.925 *U1, J3*	3.90 *U1, J3*	4.95 *U1, J3*	5.25 *U1, J3*	5.95 *U1, J3*	5.225 *A5, J3*
	Portsmouth, Ohio											5.625 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							3.99 W9				
	Youngstown, Ohio	3.95 *U1, Y1, R3*	3.95 *U1, Y1, R3*	4.925 *Y1*	4.675 *U1,C10, Y1*	6.00 *C10, Y1*	5.925 *U1* 6.425 *Y1*	3.90 *U1, Y1, R3*			5.95 *R3* 6.45 *Y1*	5.225 *Y1*
WEST	Fontana, Cal.	4.65 *K1*	4.65 *K1*		5.725 *K1*		6.975 *K1*	4.50 *K1*		6.20 *K1*	6.55 *K1*	
	Geneva, Utah							3.90 *C7*			5.95 *C7*	
	Kansas City, Mo.	4.55 *S2*	4.55 *S2*		5.275 *S2*							5.825 *S2*
	Los Angeles, Torrance, Cal.	4.65 *C7,B2*	4.65 *C7,B2*		5.725 *B2*		6.625 *B2*					6.175 *C7,B2*
	Minnequa, Colo.											
	San Francisco, Niles, Pittsburg, Cal.	4.65 *C7,P9* 4.70 *B2*	4.65 *C7,P9* 4.70 *B2*				6.675 *B2*					6.175 *C7*
	Seattle, Wash.	4.70 *B2*	4.70 *B2*				6.675 *B2*	4.80 *B2*			6.85 *B2*	
SOUTH	Atlanta, Ga.	4.50 *A8*	4.50 *A8*									5.475 *A8*
	Birmingham, Ala. Alabama City, Ala.	3.95 *T2,R3*	3.95 *T2,R3*				5.925 *T2*	3.90 *T2 R3*			5.95 *T2*	5.225 *T2, R3*
	Houston, Tex.	4.35 *S2*	4.35 *S2*		5.075 *S2*			4.30 *S2*				5.625 *S2*

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.
B1 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin Inc., Harvey, Ill.
C1 California Cold Rolled Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metal Products Co., Youngstown
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia-Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Glassport, Pa.
C11 Crucible Steel Co. of America, New York
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.
F1 Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.
G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
H1 Hanna Furnace Corp., Detroit
I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland
J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
K1 Kaiser Steel Corp., Oakland, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.
M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Co., Inc., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.
N1 National Supply Co., Pittsburgh
N2 National Tube Co., Pittsburgh
N3 Niles Rolling Mills Co., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
O1 Oliver Iron & Steel Co., Pittsburgh
P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div. Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co. (John A.), Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sloss Sheffield Steel & Iron Co., Birmingham
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Sweet's Steel Co., Williamsport, Pa.
S11 Seidelhuber Steel Rolling Mills, Seattle
T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Birmingham
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Steel Co., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.
U1 United States Steel Co., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
Y1 Youngstown Sheet & Tube Co., Youngstown

Since most steel warehouses have not yet posted new prices, warehouse steel prices are not being published here this week. These quotations will be resumed in next week's issue.

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size		Seamless		Elec. Weld	
	OD-In.	B.W. Ga.	H.R.	C.D.	H.R.	C.D.
Babcock & Wilcox	2	13	23.93	28.14	.....	.....
	2½	12	32.17	37.83	.....	.....
	3	12	35.78	42.11	.....	.....
	3½	11	44.72	52.65	.....	.....
	4	10	55.52	65.31	.....	.....
National Tube	2	13	22.81	27.94	22.23	.....
	2½	12	31.28	38.31	30.51	.....
	3	12	35.87	43.93	34.98	.....
	3½	11	42.56	52.12	.....	.....
	4	10	54.02	66.16	.....	.....
Pittsburgh Steel	2	13	.....	.....	.....	.....
	2½	12	.....	.....	.....	.....
	3	12	.....	.....	.....	.....
	3½	11	.....	.....	.....	.....
	4	10	.....	.....	.....	.....

C-R SPRING STEEL

Cents Per Lb. F.o.b. Mill	CARBON CONTENT				
	0.26-0.40	0.41-0.50	0.61-0.80	0.81-1.05	1.06-1.35
Bridgeport, Conn. *S7*	.....	.....	.....	.....	.....
Carnegie, Pa. *S9*	.....	.....	.....	.....	.....
Cleveland *A5*	5.10	7.30	8.25	10.20	12.50
Detroit *D1*	.....	.....	.....	.....	.....
New Castle, Pa. *B4*	5.80	7.65	8.25	10.20	.....
New Haven, Conn. *D1*	.....	.....	.....	.....	.....
Sharon, Pa. *S1*	5.80	7.65	8.25	10.20	12.50
Trenton, N. J. *R4*	.....	7.95	8.55	10.50	12.80
Weirton, W. Va. *W3*	.....	.....	.....	.....	.....
Worcester, Mass. *A5*	5.40	7.60	8.55	10.50	12.80
Youngstown *C5*	.....	7.65	8.25	10.20	12.50

STAINLESS STEELS

Base price, cents per lb, f.o.b. mill. Add 4.7 pct.

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	14.25	15.25	16.75	16.25	24.75	20.00	21.75	12.75	14.75	13.00
Slabs, billets, rerolling	18.50	20.00	22.00	21.00	32.25	26.25	28.50	16.50	20.00	16.75
Forg. discs, die blocks, rings	34.00	34.25	36.75	35.75	53.00	40.25	44.75	28.00	28.50	28.50
Billets, forging	26.25	26.50	28.50	27.75	41.50	31.25	35.00	21.50	22.00	22.00
Bars, wires, structurals	31.25	31.50	34.00	33.00	49.25	37.00	41.50	25.75	26.25	26.25
Plates	33.00	33.25	35.25	35.25	52.00	40.75	45.25	27.00	27.50	27.50
Sheets	41.00	41.25	43.25	43.25	57.00	49.25	53.75	36.50	37.00	39.00
Strip, hot-rolled	26.50	28.25	32.50	30.25	48.75	37.00	41.25	23.50	30.25	24.00
Strip, cold-rolled	34.00	36.75	40.25	38.75	59.00	48.25	52.25	30.50	37.00	31.00

STAINLESS STEEL PRODUCING POINTS—*Sheets*: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; McKeesport, Pa., *U1*; Washington, Pa., *W2*; (type 316 add 4.5¢) *J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Ft. Wayne, *J4*; Lockport, N. Y., *R4*.

Strip: Midland, Pa., *C11*; Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; (type 316 add 4.5¢); W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Middletown, O., *A7*; Harrison, N. J., *D3*; Youngstown, *C5*; Lockport, N. Y., *S4*; Sharon, Pa., *S1* (type 301 add ¼¢); Butler, Pa., *A7*; Wallingford, Conn., *W1*.

Bars: Baltimore, *A7*; Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Lockport, N. Y., *S4*; Canton, O., *T5*; Ft. Wayne, *J4*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*.

Plates: Brackenridge, Pa., *A3* (type 416 add ½¢); Butler, Pa., *A7*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Lockport, N. Y., *S4*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*.

Forged discs, die blocks, rings: Pittsburgh, *C11*; Syracuse, *C11*; Ferndale, Mich., *A3*; Washington, Pa., *J2*.

Forging billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *r1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*.

ALLEGHENY LUDLUM—Slightly higher on Type 301; slightly lower on others in 300 series.

WASHINGTON STEEL—Slightly lower on 300 series except where noted.

PIPE AND TUBING

Base discounts f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS					
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½–3 In.		3½–4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
STANDARD T. & C.																				
Sparrows Pt. *B3*	30.5	8.25	33.5	12.25	35.5	15.75	36.5	16.25	37.0	17.25	37.5	17.75	38.0	18.25	.....	.....	.....	.....	.....	.....
Youngstown *R3*	32.5	10.25	35.5	14.25	38.0	17.75	39.4	18.25	39.0	19.25	39.5	19.75	40.0	20.25	.....	.....	.....	.....	.....	.....
Fontana *K1*	21.0	+1.25	24.0	2.75	26.5	6.25	27.0	6.75	27.5	7.75	28.0	8.25	28.5	8.75	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	32.5	10.25	35.5	13.25	38.0	15.75	38.5	16.75	39.0	17.25	39.5	17.75	40.0	18.75	24.0	2.25	27.0	5.75	29.0	7.75
Pittsburgh *N2*	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	24.0	3.75	27.0	6.75	29.0	8.75
Alton, Ill. *L1*	31.5	9.25	34.5	13.25	37.0	16.75	37.5	17.25	38.0	18.25	38.5	18.75	39.0	19.25	.....	.....	.....	.....	.....	.....
Sharon *M3*	32.5	9.25	35.5	13.25	38.0	16.25	38.5	16.75	39.0	17.25	39.5	17.75	40.0	18.25	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	24.0	.....	27.0	.....	29.0	.....
Wheeling *W5*	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	.....	.....	.....	.....	.....	.....
Wheatland *W4*	32.5	10.25	35.5	13.25	38.0	15.75	38.5	16.75	39.0	17.25	39.5	17.75	40.0	18.75	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	24.0	3.75	27.0	6.75	29.0	8.75
Indiana Harbor *Y1*	31.5	9.25	34.5	13.25	37.0	16.75	37.5	17.25	38.0	18.25	38.5	18.75	39.0	19.25	.....	.....	.....	.....	.....	.....
Lorain *N2*	32.5	15.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	24.0	3.75	27.0	6.75	29.0	8.75
EXTRA STRONG PLAIN ENDS																				
Sparrows Pt. *B3*	30.25	9.5	34.25	13.5	36.25	17.0	36.75	17.5	37.25	18.5	37.75	19.0	38.25	19.5	.....	.....	.....	.....	.....	.....
Youngstown *R3*	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5	.....	.....	.....	.....	.....	.....
Fontana *K1*	20.75	.....	24.75	.....	26.75	.....	27.25	.....	27.75	.....	28.25	.....	28.75	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	32.25	10.0	36.25	14.0	38.25	16.0	38.75	17.0	39.25	17.5	39.75	18.0	40.25	19.0	23.75	2.0	27.75	6.5	31.25	10.0
Pittsburgh *N2*	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5	23.75	4.5	27.75	8.5	31.25	12.0
Alton, Ill. *L1*	29.25	8.5	33.25	12.5	35.25	16.0	35.75	16.5	36.25	17.5	36.75	18.0	37.25	18.5	.....	.....	.....	.....	.....	.....
Sharon *M3*	32.25	10.5	36.25	14.5	38.25	17.5	38.75	18.0	39.25	18.5	39.75	19.0	40.25	19.5	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5	23.75	.....	27.75	.....	31.25	.....
Wheeling *W5*	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5	.....	.....	.....	.....	.....	.....
Wheatland *W4*	32.25	10.0	36.25	14.0	38.25	16.0	38.75	17.0	39.25	17.5	39.75	18.0	40.25	19.0	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	32.25	11.5	36.25	15.5	37.75	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	22.5	23.75	4.5	27.75	8.5	31.25	12.0
Indiana Harbor *Y1*	31.25	10.5	35.25	14.5	37.25	17.5	37.75	18.5	38.25	19.5	38.75	20.0	39.25	20.5	.....	.....	.....	.....	.....	.....
Lorain *N2*	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5	23.75	4.5	27.75	8.5	31.25	12.0

Galvanized discounts based on zinc, at 17¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ½ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ¾ pt.; 2½ in., 3 in., ½ pt. Calculate discounts on even cents per lb of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢. Threads only buttweld and seamless, 1 pt. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 3½ pts. higher discount. Buttweld jobbers' discount, 5 pct. St. Louis zinc price now 14.0¢.

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	$14.50 to $15.00
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	$17.50 to $18.00
Foundry, oven coke	
Buffalo, del'd	$26.58
Chicago, f.o.b.	23.00
Detroit, f.o.b.	24.00
New England, del'd	24.80
Seaboard, N. J., f.o.b.	22.75
Philadelphia, f.o.b.	22.70
Swedeland, Pa., f.o.b.	22.60
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	23.50
Cleveland, del'd	25.72
Cincinnati, del'd	25.06
St. Paul, f.o.b.	22.50
St. Louis	25.40
Birmingham, del'd	21.69
Neville Island	23.00

ELECTRICAL SHEETS

22 Ga. H-R cut length F.o.b. Mill Cents Per Lb	Armature	Elec.	Motor	Dynamo	Transf. 72	Transf. 65	Transf. 58
Beech Bottom *W5*	.....	.....	.....	.....	.....	.....	.....
Brackenridge *A3*	.....	.....	.....	.....	.....	.....	.....
Granite City *G2*	.....	8.55	9.80	.....	.....	.....	.....
Ind. Harbor *I3*	7.35	7.85	9.10	.....	.....	.....	.....
Mansfield *E2*	.....	.....	.....	.....	.....	.....	.....
Niles, O. *N3*	.....	.....	.....	.....	.....	.....	.....
Vandergrift *U1*	7.35	7.85	9.10	9.90	10.45	11.00	11.70
Warren, O. *R3*	7.35	7.85	9.10	.....	.....	.....	.....
Zanesville *A7*	7.35	7.85	9.10	9.90	10.45	11.00	11.70

CAST IRON WATER PIPE

	Per Net Ton
6 to 24-in., del'd Chicago	$105.30 to $108.80
6 to 24-in., del'd N.Y.	108.50 to 109.50
6 to 24-in., Birmingham	91.50 to 96.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less	$123.00 to $130.00

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges

Producing Point	Basic	Foundry	Malleable	Bessemer	Low Phos.	Bl. Furnace Silvery	Low Phos. Charcoal
Bethlehem *B3*	54.00	54.50	55.00	55.50	.....	.....	.....
Birmingham *R3*	48.38	48.88	.....	.....	.....	.....	.....
Birmingham *W9*	48.38	48.88	.....	.....	.....	.....	.....
Birmingham *S5*	48.38	48.88	.....	.....	.....	.....	.....
Buffalo *R3*	52.00	52.50	53.00	.....	.....	.....	.....
Buffalo *H1*	52.00	52.50	53.00	.....	.....	63.75	.....
Chicago *I4*	2.00	52.50	52.50	53.00	.....	.....	.....
Cleveland *A5*	2.00	52.50	52.50	53.00	57.00	.....	.....
Cleveland *R3*	2.00	52.50	52.50	.....	.....	.....	.....
Daingerfield, Tex. *L3*	48.00	48.50	48.50	.....	.....	.....	.....
Duluth *I4*	52.00	52.50	52.50	53.00	.....	.....	.....
Erie *I4*	52.00	52.50	52.50	53.00	.....	.....	.....
Everett, Mass. *M6*	.....	59.75	60.25	.....	.....	.....	.....
Fontana *K1*	58.00	58.50	.....	.....	.....	.....	.....
Geneva, Utah *U1,Y1*	52.00	52.50	52.50	53.00	.....	.....	.....
Granite City, Ill. *K3*	53.90	54.40	54.90	.....	.....	.....	.....
Hubbard, Ohio *Y1*	52.00	52.50	52.50	.....	.....	.....	.....
Ironton Utah *C7*	52.00	52.50	.....	.....	.....	.....	.....
Jackson, Ohio *J1,G1*	.....	.....	.....	.....	.....	62.50	.....
Lyle, Tenn. *T3*	.....	.....	.....	.....	.....	.....	66.00
Monessen *P6*	54.00	.....	.....	.....	.....	.....	.....
Neville Island *P4*	52.00	52.50	52.50	53.00	.....	.....	.....
Pittsburgh *U1*	52.00	.....	.....	53.00	.....	.....	.....
Sharpsville *S3*	52.00	52.50	52.50	53.00	.....	.....	.....
Steelton *B3*	54.00	54.50	55.00	55.50	60.00	.....	.....
Swedeland *A2*	56.00	56.50	57.00	57.50	.....	.....	.....
Toledo *I4*	52.00	52.50	52.50	53.00	.....	.....	.....
Troy, N. Y. *R3*	54.00	54.50	55.00	.....	60.00	.....	.....
Youngstown *Y1*	52.00	52.50	52.50	53.00	.....	.....	.....
N. Tonawanda, N. Y. *T1*	.....	52.50	53.00	.....	.....	.....	.....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base, (1.75 to 2.25 pct, except low phos., 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 pct and over. Silvery iron: Add $1.50 per net ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. $1 per ton for 0.75 pct or more phosphorus, manganese as above. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Col	Woven Wire Fence 9–15½ ga. Col	Fence Posts Col	Single Loop Bale Ties Col	Twisted Barbless Wire Col	Gal. Barbed Wire Col	Merch. Wire Ann'l ¢/lb.	Merch. Wire* Gal. ¢/lb.
Alabama City *R3*	.....	.....	.....	.....	.....	.....	.....	.....
Aliquippa, Pa. *J3*	127	141	.....	.....	.....	148	6.075	6.525
Atlanta *A8*	130	140	.....	135	.....	149	6.325	6.675
Bartonville *K2*	.....	.....	.....	.....	.....	.....	.....	.....
Buffalo *W6*	.....	.....	.....	.....	.....	.....	.....	.....
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	.....	6.075	6.225
Crawfrdsvl. *M4*	.....	.....	.....	.....	.....	.....	.....	.....
Donora, Pa. *A5*	127	133	.....	132	.....	142	6.075	6.225
Duluth *A5*	127	133	.....	132	.....	142	6.075	6.225
Fairfield, Ala. *T2*	127	133	.....	132	.....	142	6.075	6.225
Houston *S2*	135	147	.....	.....	.....	156	6.475	6.925
Johnstn., Pa. *B3*	127	.....	148	.....	149	.....	.....	6.575
Joliet, Ill. *A5*	127	133	.....	132	.....	142	6.075	6.225
Kokomo, Ind. *C9*	.....	.....	.....	.....	.....	.....	.....	.....
Los Angeles *B2*	.....	.....	.....	.....	.....	.....	7.025	.....
Kansas City *S2*	139	.....	.....	144	.....	160	6.675	7.125
Minnequa *C6*	.....	.....	.....	.....	.....	.....	.....	.....
Monessen *P6*	.....	.....	.....	.....	.....	.....	.....	.....
Moline, Ill. *R3*	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburg, Cal. *C7*	146	156	.....	156	162	162	7.025	7.125
Portsmouth *P7*	132	.....	.....	.....	.....	.....	6.47	.....
Rankin, Pa. *A5*	127	133	.....	.....	.....	142	6.075	6.225
So. Chicago *R3*	.....	.....	.....	.....	.....	.....	.....	.....
S. San Fran. *C6*	.....	.....	.....	.....	.....	.....	.....	.....
Sparrows Pt. *B3*	129	.....	.....	134	151	.....	.....	6.675
Sterling, Ill. *N4*	.....	.....	.....	.....	.....	.....	.....	.....
Struthers, O. *Y1*	.....	.....	.....	.....	.....	.....	.....	.....
Torrance, Cal. *C7*	147	.....	.....	.....	.....	.....	7.025	.....
Worcester *A5*	133	.....	.....	.....	.....	.....	6.375	6.525
Williamsport, Pa. *S10*	.....	.....	.....	.....	.....	.....	.....	.....

Cut Nails, carloads, base $7.80 per 100 lb. (less 20¢ to jobbers), at Conshohocken, Pa., (*A2*), Wheeling, W. Va., (*W5*), $7.15.

* Alabama City and So. Chicago don't include zinc extra.

UNIVERSITY OF MICHIGAN LIBRARIES

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices

(Base, discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Nuts, Hot Pressed, Cold Punched—Sq.

Pct Off List

	Less Keg. Reg.	K.	Less Keg. Hvy.	K.
½ in. & smaller	15	28½	15	28½
9/16 in. & ⅝ in.	12	25	6½	21
¾ in. to 1½ in. inclusive	9	23	1	16½
1⅝ in. & larger	7½	22	1	16½

Nuts, Hot Pressed—Hexagon

½ in. & smaller	26	37	22	34
9/16 in. & ⅝ in.	16½	29½	6½	21
¾ in. to 1½ in. inclusive	12	25	2	17½
1⅝ in. & larger	8⅛	23	2	17½

Nuts, Cold Punched—Hexagon

½ in. & smaller	26	37	22	34
9/16 in. & ⅝ in.	23	35	17½	30½
¾ in. to 1½ in. inclusive	19½	31½	12	25
1⅝ in. & larger	8½	28	2	17½

Nuts, Semi-Finished—Hexagon

	Reg.		Hvy.	
½ in. & smaller	35	45	28½	39½
9/16 in. & ⅝ in.	23	35	17½	30½
¾ in. to 1½ in. inclusive	24	36	15	28½
1⅝ in. & larger	13	26	8½	23
	Light			
7/16 in. & smaller	35	45		
½ in. thus ⅝ in.	28½	39½		
¾ in. to 1½ in. inclusive	26	37		

Stove Bolts — *Pct Off List*

Packaged, steel, plain finished	48—10
Packaged, plate finish	31—10
Bulk, plain finish**	62*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets — *Base per 100 lb*

½ in. & larger	$7.85

Cap and Set Screws

(In bulk)	*Pct Off List*
Hexagon head cap screws, coarse or fine thread, ¼ in thru ⅝ in. x 6 in., SAE 1020, bright	54
¾ in. thru 1 in. up to & including 6 in.	48
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat	46
¾ in. thru 1 in. up to & including 6 in.	41
Milled studs	35
Flat head cap screws, listed sizes	16
Fillister head cap, listed sizes	34
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter	53

Machine and Carriage Bolts

Pct Off List

	Less Case	C.
½ in. & smaller x 6 in. & shorter	15	28½
9/16 in. & ⅝ in. x 6 in. & shorter	18½	30½
¾ in. & larger x 6 in. & shorter	17½	29½
All diam. longer than 6 in.	14	27½
Lag, all diam. x 6 in. & shorter	23	35
Lag, all diam. longer than 6 in.	21	33
Plow bolts	34	....

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer *U1*	3.775	4.25	4.925	....	....	....	....
Chicago *R3*	....	....	....	....	....	....	....
Cleveland *R3*	....	....	....	....	....	....	....
Ensley *T2*	3.775	4.25	....	....	....	....	....
Fairfield *T2*	....	4.25	....	6.65	....	4.775	....
Gary *U1*	3.775	4.25	....	....	....	4.775	....
Ind. Harbor *I3*	3.775	....	4.925	6.65	....	4.775	....
Johnstown *B3*	....	4.25	....	....	....	....	....
Joliet *U1*	....	4.25	4.925	....	....	....	....
Kansas City *S2*	....	....	....	....	....	....	....
Lackawanna *B3*	3.775	4.25	4.925	....	....	4.775	....
Lebanon *B3*	....	....	....	6.65	....	....	....
Minnequa *C6*	....	....	....	....	....	....	....
Pittsburgh *R3*	....	....	....	....	....	....	....
Pittsburgh *O1*	....	....	....	....	....	....	....
Pittsburgh *P5*	....	....	....	....	....	....	....
Pittsburgh *J3*	....	....	....	....	....	....	....
Pitt'g., Cal. *C7*	....	....	....	....	....	4.925	....
Seattle *B2*	....	....	....	....	....	4.925	....
Steelton *B3*	3.775	....	4.925	....	....	4.775	....
Struthers *Y1*	....	....	....	....	....	....	....
Torrance *C7*	....	....	....	....	....	4.925	....
Youngstown *R3*	....	....	....	....	....	....	....

TOOL STEEL

F.o.b. mill
Add 4.7 pct

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.505
18	4	1	—	5	$2.13
18	4	2	—	—	$1.65
1.5	4	1.5	8	—	81.0¢
6	4	2	6	—	96.5¢

High-carbon chromium	63.5¢
Oil hardened manganese	35¢
Special carbon	32.5¢
Extra carbon	27¢
Regular carbon	23¢

Warehouse prices on and east of Mississippi are 3.5¢ per lb. higher. West of Mississippi, 5.5¢ higher.

CLAD STEEL

Add 4.7 pct

Seamless-carbon	Plate	Sheet
No. 304, 20 pct.		
Coatesville, Pa. *L4*	*29.5	
Washington, Pa. *J2*	*29.5	
Claymont, Del. *C4*	*28.00	
Conshohocken, Pa. *A2*		*27.50
New Castle, Ind. *I2*	*29.77	*26.24
Nickel-carbon		
10 pct Coatesville, Pa. *L4*	32.5	
Inconel-carbon		
10 pct Coatesville, Pa. *L4*	40.5	
Monel-carbon		
10 pct Coatesville, Pa. *L4*	33.5	
No. 302 Stainless-copper stainless, Carnegie, Pa. *A4*		77.00
Aluminized steel sheets, hot dip, Butler, Pa. *A7*		7.75

* Includes annealing and pickling, or sandblasting.

ELECTRODES

Cents per lb, f.o.b., plant threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb.
	GRAPHITE	
17, 18, 20	60, 72	17.85
8 to 16	48, 60, 72	17.85
7	48, 60	19.57
6	48, 60	20.95
4, 5	40	21.50
3	40	22.61
2½	24, 30	23.15
2	24, 30	25.36
	CARBON	
40	100, 110	8.03
35	65, 110	8.03
30	65, 84, 110	8.03
24	72 to 104	8.03
20	84, 90	8.03
17	60, 72	8.03
14	60, 72	8.57
10, 12	60	8.84
8	60	9.10

FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill. Price, net ton: Effective CaF_2 content:

70% or more	$43.00
60% or less	40.00

REFRACTORIES

Fire Clay Brick — *Carloads, per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5)	$94.60
No. 1 Ohio	88.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	88.00
No. 2 Ohio	79.20
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	13.75

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$94.60
Childs, Pa.	99.00
Hays, Pa.	100.10
Chicago District	104.50
Western Utah and Calif.	111.10
Super Duty, Hays, Pa., Athens, Tex., Chicago	111.10
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	16.50
Silica cement, net ton, bulk, Hays, Pa.	18.70
Silica cement, net ton, bulk, Ensley, Ala.	17.60
Silica cement, net ton, bulk, Chicago District	17.60
Silica cement, net ton, bulk, Utah and Calif.	24.70

Chrome Brick — *Per Net Ton*

Standard chemically bonded Balt., Chester	$82.00

Magnesite Brick

Standard, Baltimore	$104.00
Chemically bonded, Baltimore	93.00

Grain Magnesite *St. ⅝-in. grains*

Domestic, f.o.b. Baltimore in bulk fines removed	$62.70
Domestic, f.o.b. Chewalah, Wash., in bulk	36.30
in sacks	41.80

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢	$13.75

LAKE SUPERIOR ORES

51.50% *Fe; natural content, delivered lower Lake ports. 1952 prices not yet established. 1951 prices were:*

Old range, bessemer	$8.70
Old range, nonbessemer	8.55
Mesabi, bessemer	8.45
Mesabi, nonbessemer	8.30
High phosphorus	8.30

After adjustments for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in Lake vessel rates, upper Lake rail freights, dock handling charges and taxes thereon.

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.l.f. New York, ocean bags	10.9¢
Canadian sponge iron, del'd, in East	10.00¢
Domestic sponge iron, 98+% Fe, carload lots	15.5¢ to 17.0¢
Electrolytic iron, annealed, 99.5+% Fe	44.0¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	60.0¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe.	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe.	83.0¢ to $1.48
Aluminum	31.5¢
Brass, 10 ton lots	30.00¢ to 33.25¢
Copper, electrolytic	10.75¢ plus metal value
copper, reduced	10.00¢ plus metal value
Cadmium, 100-199 lb.	95¢ plus metal value
Chromium, electrolytic, 99% min., and quantity, del'd	$3.50
Lead	7.5¢ to 12.0¢ plus metal value
Manganese	57.0¢
Molybdenum, 99%	$2.75
Nickel, unannealed	88.0¢
Nickel, annealed	95.0¢
Nickel, spherical, unannealed	92.0¢
Silicon	38.5¢
Solder powder	7.0¢ to 9.0¢ plus met. value
Stainless steel, 302	83.00¢
Stainless steel, 316	$1.10
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$6.00
Zinc, 10 ton lots	23.0¢ to 30.5¢

Ferroalloy Prices

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk in carloads delivered. (65-72% Cr, 2% max. Si.)

0.06% C	30.50	0.20% C	29.50
0.10% C	30.00	0.50% C	29.25
0.15% C	29.75	1.00% C	29.00
2.00% C			28.75
65-69% Cr, 4-9% C			22.00
62-66% Cr, 4-6% C, 6-9% Si			22.60

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.14
0.50% max. C	1.10
9 to 11% C	1.08

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 21.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si.

Bulk 1-in. x down, 21.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, dump delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	20.00
Ton lots	22.30
Less ton lots	23.30

CMSZ

Contract price, cents per lb of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	20.75
Less ton lots	22.00

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.50
Less ton lots	19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.50
Less ton lots	17.75

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.00
Ton lots to carload packed	19.00
Less ton lots	20.50

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size.

F.o.b. Niagara Falls, Alloy, W. Va., Ashtabua, O. $225
F.o.b. Johnstown, Pa. $227
F.o.b. Sheridan, Pa. $225
F.o.b. Etna, Clairton, Pa. $228

Add $2.80 for each 1% above 82% Mn, subtract $2.80 for each 1% below 78% Mn.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	12.45
Ton lots, packed	14.05

Spiegeleisen

Contract prices gross ton; lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$84.00	$85.00
Pgh. or Chicago	84.00	85.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	36.95
Ton lots	38.45

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	30.00
Ton lots	32.00
Less ton lots	34.00 to 37.00

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	28.45	30.30	31.50
0.07% max. C	27.95	29.80	31.00
0.15% max. C	27.45	29.30	30.50
0.30% max. C	26.95	28.80	30.00
0.50% max. C	26.45	28.30	29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30	26.50

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn 21.35¢

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.

Carload bulk	11.40
Ton lots	13.05
Briquet, contract basis carlots, bulk delivered, per lb of briquet	12.65
Ton lots, packed	14.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $92.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $90.00. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	18.00
97% Si, 1% Fe	18.50

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk	6.95
Ton lots	8.55

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	14.30
50% Si	12.40	85% Si	15.55
90-95% Si			17.00

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrovanadium

35-55% contract basis, delivered, per pound, contained V.

Openhearth	$3.00-$3.10
Crucible	3.10- 3.20
High speed steel (Primos)	3.20- 3.25

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.

Carloads	9.90
Ton lots	11.30

Calcium molybdate, 45.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.15

Ferrocolumbium, 50-60% 2 in. x D, contract basis, delivered per pound contained Cb.

Ton lots	$4.30
Less ton lots	4.95

Ferro-Tantalum-Columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta $3.75

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo. $1.32

Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton $65.00
10 tons to less carload $75.00

Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagra Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots 1.55

Ferrotitanium, 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $177.00

Ferrotungsten, standard, lump or ¾ x down, packed, per pound contained W5, ton lots, delivered $5.00

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. $1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.13

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound

Carload, bulk lump	14.50¢
Ton lots, bulk lump	15.75¢
Less ton lots, lump	16.25¢

Vanadium Pentoxide, 86-89% V_2O_5 contract basis, per pound contained V_2O_5 $1.18

Zirconium, 35-40%, contract basis f.o.b. plant, freight allowed, per pound of alloy.
Ton lots 21.00¢

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.
Carload, bulk 7.00¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B.... $5.35

Bortam, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti, 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.
Ton lots, per pound 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots.... $1.30
F.o.b. Wash., Pa.; 100 lb up

10 to 14% B	.95
14 to 19% B	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.

No. 1	$1.00
No. 6	68¢
No. 79	50¢

Manganese - Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd

Ton lots	$1.46
Less ton lots	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered $1.80
Less ton lots

Silcaz, contract basis, delivered.
Ton lots 45.00¢

WHEELING STEEL CORPORATION
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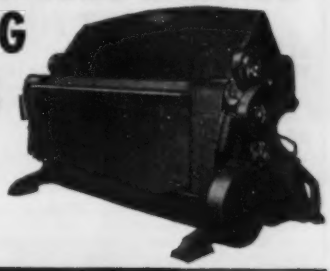
LA BELLE CUT NAILS

WHEELING STEEL

STEEL HAND AND POWER
CHICAGO BENDING BRAKES



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Special Bending Brakes
Double Folder Brakes

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CHICAGO
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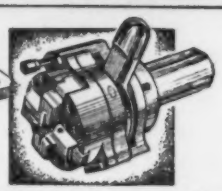
H&G Insert Chaser DIE HEADS



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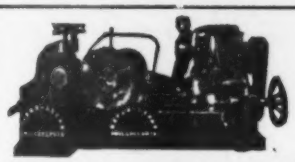

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A hardness tester particularly adapted for use on CASTINGS and FORGINGS

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Gap, 10" high
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Can be used in any position—even upside down.
Equally accurate as portable or stationary equipment.
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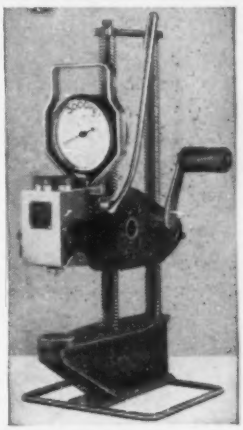

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72'6" x 140' Steel Building—NEW—Designed for Corrugated Steel Siding and to carry load of 30 ton overhead electric traveling crane.

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6000 lb. Brosius Floor Type Gasoline Driven Charging Machine. Equipped with Peel, Gasoline Engine, Rubber Tires.

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5 ton Niles Crane 56' 3 3/8" Span. Three motors, 440 volt, 3 phase, 60 cycle.

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3/8" McCabe Pneumatic Flanging Machine, Pneumatic Holddowns, Circle Flanging Attachment.

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8" Ajax Forging Machine or Upsetter, Motor driven. Equipped with Air Clutch.

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Surface Combustion Super Fast Heating Furnace Tangential Burner, 3 Section, Pusher Capacity 3600 lb. per hr. gross, Max. Temp. 2750° F. Complete Elecl. Equip.

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400 lb. Moore Type "UT" Melting Furnace Top Charge. Complete with Transformer. New 1943—Little Used.
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60" Aetna-Standard Roller Leveler, Motor Driven. 17 Rolls 4 1/8" Dia.

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48" x 48" x 20' Cincinnati, Four Head
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Type "B" Crown Full Automatic, Nickel & Chrome Plating Machine, Max. Work Size 16" wide x 36" deep x 4" thick.

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1000 ton Bliss #27 Knuckle Joint, Embossing & Coining Press, 2 1/2" stroke, 18" Shut Height.

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8" x 18" Schmitz Single Stand Two High With Friction Drive Rewinder.
12 1/2" x 16" Philadelphia Two High Cold Rolling Mill. Complete with Pinion Stand, 75 H.P. Motor 440/3/60. Starter and Controls, Incl. Coiler.
12" x 14" Waterbury Farrel Single Stand Two High. Complete with Gear Reducer and 50 H.P. A.C. Motor.
18" x 24" Waterbury Farrel Two Stand Two High Rolling Mill. Complete with Elec. Equip.

STRAIGHTENERS
No. 3 Medart 3-Roll Straightening Machine Capacity 1" to 3 1/2" Bars or 4 1/2" O. D. Pipe or Tubing. NEW 1950.
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300,000 lb. SOUTHWARK-EMERY Universal Hydraulic Testing Machine.

TRIMMING LINE
#1049 Torrington Trimming Line, With Feed Rolls and Scrap Cutter. Capacity for steel or aluminum alloys 1/8" max. Trimmed width 22" min. 66" max. Scrap Length 3/4" min. 2 1/4" max.

UNIVERSAL IRONWORKERS
Ryerson Steel Frame Universal Iron Worker, M.D Capacity Punch 3/4" thru 3/4", Shear 1" Square 1 1/4" Round, 1/2" x 4" Flat, 4 x 4 x 1/4" Angles
No. 28U-30 Buffalo Armor Plate Universal Ironworker—Combination Punch, Shear & Bar Cutter. Motor Driven Capacities—Shear 3" Round, 2 1/2" Square, 5x1 1/8" Flat, 5x5x1/2" Angles, 12"—31 1/2# Beams, etc., Punch 1 1/2" thru 1 1/4".

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Phone—Cort 7-3437

The Clearing House

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Derelict—New York's used machine tool business is becalmed. Some dealers had hoped the steel strike settlement might produce a breeze sufficient to take some of the slack out of their sails and sales. But the effect of the strike's end didn't even amount to a puff of wind by the time it reached New York.

As usual, the only items creating any buyer interest are late model units. But the problem of trying to find this equipment for resale has not eased in the slightest for the dealer. And even when a dealer has the good fortune to find an up-to-date piece of equipment, the demand for it isn't anywhere near so strong as it was.

Compounding the market gloom rentals are at a low ebb and trade between dealers has reached a standstill.

Slight Boost—Naturally, end of the steel dispute did have more of an effect in the Pittsburgh district. But business is still not anything to get excited about.

In steel mill equipment, the market showed some improvement. But dealers reported this was partially due to foreign business. Domestic inquiries are increasing, but conversion of interest into sales was slow.

Indications are that mills have adopted a cautious attitude on capital expenditures, at least for the rest of this year. The strike has left many potential buyers short of cash. Until this situation has been cleared up, buying of used machinery by this source will be limited.

Standardized Accounting — An interesting article in the most recent edition of *NISA News*, official organ of the National Industrial Service Assn., points up the need for standardizing accounting methods in the electrical repair industry. It is safe to assume that the need is probably as great in the used machinery business also.

In analyzing the results of a recent NISA sales survey, the publication shows some startling advantages that appear to result merely from running a firm on a partnership or sole proprietorship basis rather than as a corporation.

For example, the study showed gross profits for partnerships and single-owner firms averaged 44 pct of sales while corporations rated only 31.5 pct. Partnerships were able to pay their employees 8.5 pct of sales while corporations paid workers only 7.2 pct of sales.

Pay More—Corporations get a slightly better break in rental paid for their place of business, spending only .9 pct of sales for this item while partnerships dropped 1.6 pct. It also appears that equipment used in partnership organizations gets harder wear, as it depreciates 70 pct faster than units in corporate organizations (1.7 pct of sales as compared to 1.0 pct).

On the question of local taxes, corporations pay 50 pct more than partnerships. Cost to the corporations is 1.5 pct of sales compared to 1.0 pct for partnerships.

Easy Profits — Following the survey figures, owners by switching from a corporate organization to a partnership would improve their lot in the form of net income before taxes by 67 pct (22.4 pct of sales as opposed to 13.4 pct).

As the article points out, an owner does not suddenly become a smarter business man because he changes his firm's form of ownership. Obviously the peculiarities pointed up in the survey are a result of different accounting methods used by the firms answering the questionnaire. Unfortunately, varying approaches to accounting procedure minimize the effectiveness of such studies, which, if methods were standardized, could be a source of vital information.